EVALUATING THE EFFECTIVENESS OF FIRST GRADE LITERACY INTERVENTIONS: READING RECOVERY AND LEVELED LITERACY INTERVENTION

Heidi Thomson Miller

B.S., University of Northwestern, 1997

M.Ed., Bethel University, 2010

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Approved by:

Michele Brouse, Ph.D.

Tracy Reimer, Ph.D

Michael Lindstrom, Ed.D.

ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 - 1346

Abstract

This is a quantitative research project utilizing secondary data. Reading Recovery and Leveled Literacy Intervention are two early literacy interventions based on a whole language and phonetic approach to reading instruction. For the purposes of this study, the end-of-first-grade benchmark is a Developmental Reading Assessment (DRA) 18 and the end-of-second-grade benchmark is a DRA 30. This study utilizes descriptive analyses, ANOVA, and ANCOVA analyses of variance, and regression analyses to determine which programs bring tier 3, non-special education readers to grade level status at the conclusion of first grade. Reading Recovery successfully brings first-grade students to grade level status ($p = .002$), and 47.1% of students who participated in this intervention met the end-of-first-grade benchmark. Overall, their mean end-of-kindergarten DRA score was a text level 3, and their mean end-of-first-grade DRA score was a text level 16. For students who participated in Leveled Literacy Intervention (LLI), 35.3% met the end-of-first-grade benchmark. Overall, their mean end-of-kindergarten DRA score was a text level 3, and their mean end-of-first-grade DRA score was a text level 14. LLI was not found to be statistically significant ($p = .607$). For students who participated in both Reading Recovery and Leveled Literacy Intervention, 30.1% met the end-of-first-grade benchmark. Overall, their mean end-of-kindergarten DRA score was a text level 3, and their mean end-of-first-grade DRA score was a text level 14. The combination RR and LLI group was not found to be statistically significant ($p = .877$).

According to this study, for students who participate in either Reading Recovery or Leveled Literacy Intervention, a child's gender (ANOVA $p = .000$,

ANCOVA p = .000), and ethnicity (ANOVA Black p = .214, Other p = .067; ANCOVA Black p = .765, Other p = .556) is not a significant predictor of their end-of-first-grade DRA level. Depending upon the analysis conducted, a child's free or reduced lunch rate (ANOVA p = .005, ANCOVA p = .283) is a significant predictor of their end-of-first grade DRA level $F(2,1) = 5.416$, p = .005 with an R^2 value of .033 and an error of 612. As anticipated, a child's initial kindergarten DRA level remains the most significant predictor of their end-of-first-grade DRA level (ANOVA p = .000, ANCOVA p = .000). The lowest scoring students in kindergarten tend to also be the lower scoring students at the end of first and second grades. The second greatest predictor for children who do not participate in Reading Recovery or Leveled Literacy Intervention is the child's free or reduced lunch rate (p = .005). However, when an ANCOVA analysis of variance analyzed only students with a complete data set, kindergarten through second grade, a child's lunch rate (p = .283) was shown not to be a significant predictor of end-of-first-grade DRA reading level. Additionally, a child's lunch rate is not shown to be a significant predictor of a child's text growth gain.

The study follows students who met the end-of-first-grade DRA 18 benchmark into second grade to ascertain if the students are able to maintain their grade level status. For students who participated in Reading Recovery and met the end-of-first-grade benchmark, 58.7% also met the end-of-second-grade benchmark. Their mean end-of-second-grade DRA score was a text level 30. For students who participated in Leveled Literacy Intervention and met the end-of-first-grade benchmark, 62.8% also met the end-of-second-grade benchmark. Their mean end-of-

second-grade DRA score was a text level 30. For students who participated in both Reading Recovery and Leveled Literacy Intervention and met the end-of-first-grade benchmark, 53.8% also met the end-of-second-grade benchmark. Their mean end-of-second-grade DRA score was a text level 28.

Finally, the study utilized a regression analysis to determine if there is a difference in reading achievement growth based upon a student's participation in Reading Recovery or Leveled Literacy Intervention. All analyses were controlled for initial DRA level, gender, ethnicity, and free or reduced lunch rate. The results found that while both programs appear to be moving students towards grade level status, Reading Recovery's results are significant ($p = .002$), LLI's results are not significant ($p = .607$), and the combination group of both RR and LLI are not significant ($p = .877$). According to this one year study, for students who participated in Reading Recovery or Leveled Literacy Intervention as first graders, once a child learns how to read, the variables—initial DRA level, gender, ethnicity and socio-economic status—do not affect a child's continued reading achievement.

Dedication

First and foremost, I want to thank my Lord and Savior Jesus Christ for providing me with the opportunity, resources, and academic ability to achieve this dream. Many nights I repeated the verse "I can do all things through Christ who gives me strength" (Phil. 4:13) as I pushed myself to take the next step in this long and arduous journey.

I am incredibly blessed to have a husband who leads our family in the ways of the Lord. Michael, you are my rock and my champion. You are the one I fully trust, depend upon, and desire to share my life with. Without you, this dream would not be a reality. I appreciate all of the late-night pep talks, all of the dinners you prepared, errands you ran, and the million things you did to hold our lives together while I hid away in our sunroom to write…and write…and write. I love you with all of my heart, and I'm excited to embark on our next adventure together. I'm so glad that you are mine!!

London and Jada, I am absolutely proud of you and the teenagers that you are becoming. You are smart, strong, compassionate Christians, and super fun! You have captured my heart, and I love both of you more than life. Being your mom is my greatest responsibility and joy!

Devin, Aidan, and Regan, you mean the world to me, and I love you! I'm so proud of each of you and your unique and special gifts. I am incredibly blessed to have you in my life. God's faithfulness and blessings are abundant. I smile every

day because the Lord chose to bless me with the responsibility and joy of being your step-mom.

Grandpa! Wow—thank you! Your confidence in me is genuine and special. Thank you for all of your long hours of editing, correcting, and perfecting. You are a treasured gift! Your legacy of leadership and devotion resonates with me, but more than that, your never-ending love for Grandma touches my heart to its very core.

Mom and Dad, do you remember when I first began this journey? When I achieved my very first "A" you sent me a bouquet of flowers and expressed your pride in me. Words will never be able to describe how much that meant to me then and continues to mean to me now. Deep in my heart, I wanted you to know and believe that I could achieve this dream.

To my extended family and friends – I have a life again and I miss you! Thank you for your support and patience as I pursued this ambitious goal.

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I would like to thank the district under study for providing clean and confidential data in an easy-to-utilize format. I trust that the research results will provide insightful information and allow the district to make early literacy decisions that will benefit the district's most at-risk kindergarten, first, and second grade students.

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List of Abbreviations

1. An Observation Survey of Early Literacy Achievement…..……..….OS
2. Common Core State Standards…….……..……....…CCSS
3. Center for Reading Recovery and Literacy Collaborative……...CRR
4. Developmental Reading Assessment……...…….…..…..DRA
5. Early Intervention in Reading……...…….……....EIR
6. Free and Reduced Lunch Price……..FRP
7. Individuals with Disabilities Education Act……...IDEA
8. International Date Evaluation Center (Reading Recovery)…….IDEC
9. Kindergarten……..Kdg
10. Leveled Literacy Intervention……LLI
11. Minnesota Comprehensive Assessment……..MCA
12. Reading Recovery……..……RR
13. Response to Intervention…….…….……...RtI
14. Systematic Package for the Social Science…….……SPSS

Chapter I: Introduction

Introduction to the Problem

School districts are looking for effective ways to evaluate their literacy curricula and to make informed decisions based upon current research. Effective early interventions enable teachers to address students' needs when they are learning to read in kindergarten and first grade rather than in upper grades where struggling students may already be failing academically and are frustrated about learning in general (Velluntino, Scanlon, Small, & Fanuele, 2006; Wanzek & Roberts, 2012).

It is estimated that 75-80% of American students successfully reach grade level benchmarks through tier 1 (classroom) instruction. Students who receive tier 2 interventions have below grade level benchmarks, but do not require the intense interventions of tier 3 students who are significantly below grade level, and are at risk of not reaching grade level benchmarks, and possibly qualifying for special education services (http://rtinetwork.org/, 2013; Shapiro, 2013). Lyon (1995) and Drummond (2014) shared that up to 80% of students who qualify for special education services, qualify in the area of reading. Drummond (2014) also shared that about 10 million U.S. children have difficulties learning to read, but through appropriate early literacy interventions, 90% may overcome their difficulties. The law and reading research

(Haager, Klingner, Vaughn, 2010; Mesmer & Mesmer, 2009; RTInetwork.org) allow for increased interventions through instructional time and/or group size to meet the increased needs of students.

Research links early literacy to academic achievement, higher graduation rates, and enhanced productivity in adulthood (Dell-Antonia, 2012; Strickland & Riley-Ayers, 2013; Worthy & Viise, 1996). The Nation's Report Card, also known as the National Assessment of Educational Progress (NAEP), reveals that we have made productive strides ($p < .05$) in fourth-grade reading scores between the years 1992-2013. The Nation's Report Card also shares that there is a significant increase ($p < .05$) in eighth-grade reading scores between the years 1992-2013 and specifically in the years 2011-2013 (NAEP, 2013).

Reading Recovery (RR) and Leveled Literacy Intervention (LLI) are early literacy programs designed to address the needs of struggling readers (Heinemann, 2014; RRCNA, 2014). This study analyzes both programs individually and in combination to determine if they are effective at helping students reach grade-level benchmarks in first grade, and maintain their success through second grade. Additionally, this study determines if there is a difference in student growth, as shown through Developmental Reading Assessment (DRA) achievement levels, by participating in Reading Recovery, Leveled Literacy Intervention, or a combination of both RR and LLI. Chapter I begins with a background of the study, moves towards the problem and research questions, includes definitions of important terms, and concludes with assumptions and limitations.

Background of the Study

Currently, American school districts are investing a significant amount of financial resources in public school education. During the 2009-10 school year, the local, state, and federal branches of American government spent $638 billion on elementary and secondary public schooling, or about $12,743 per public school student (U.S. Department of Education, 2013). Funding for intervention programs may be supplied through a variety of sources including: federal Title I, Part A funds; state Compensatory Education funds; special education funds; and private grants (Elementary and Secondary Education Act, 2001; http://rtinetwork.org/).

A component of the Individuals with Disabilities Education Act (IDEA) is the Response to Intervention (RtI) approach to reading instruction (IDEA.gov, 2013). RtI categorizes literacy instruction into three tiers. Tier 1 is a district's core reading instruction, such as guided reading or a basal reader approach. The Florida Center for Reading Research (2006) recommends that first-grade teachers provide 90 minutes of daily reading block time (50-70 minutes spent in small groups or individual centers, and 20-40 minutes spent in whole group instruction). Tier 2 is a small group intervention (such as an additional guided reading lesson or a specially designed tier 2 intervention program) for students who need supplemental literacy interventions, and are at some risk of academic failure if their needs are not identified and addressed. Typically, the supplemental programs teacher works with three-four students for 20-minute sessions, four-five days per week. Tier 3 is intensive intervention for students who are at a high risk for academic failure. The instruction may be one-on-one (such

as Reading Recovery), or small group instruction (such as Leveled Literacy Intervention). Typically, sessions last for 30 minutes, five days a week. If students do not meet grade level benchmark after completing the literacy interventions, they likely will be considered candidates for special education services (District website, 2013; IDEA.gov, 2013; Shapiro, 2013).

The Developmental Reading Assessment (DRA) is an individually administered assessment of a child's reading capabilities (Beaver, 1999). A child's DRA independent text level reading score includes mastery of accuracy, fluency, and comprehension at a score of 90% or above (Beaver, 1999; Scholastic, 2014). Teachers use a child's DRA reading level to drive their instruction. Typically, a teacher will instruct a student at one to two levels above the child's independent level (Richardson, 2014). Students will be assigned one of the following independent text levels upon completion of the DRA assessment: 0.5, 1, 2, 3, 4, 5, 6, 8, 10, 12, 14, 16, 18, 20, 24, 28, 30, 34, 38, 40, 50, 60, 70, or 80 (Beaver, 1999).

This study explores which first grade early literacy interventions will bring tier 3, non-special-education students to grade level status at the conclusion of their first-grade year. Students who began their first-grade year at a Developmental Reading Assessment level of three or below (Beaver, 1999) are included in the research. Specifically, this study evaluates the results of three early literacy intervention approaches: Reading Recovery (RR), Leveled Literacy Intervention (LLI), and a combination of RR and LLI. The end-of-first-grade benchmark is a DRA 18. The readers who achieved this benchmark, will be followed through second grade to see if they achieve the end-of-second-grade benchmark, which is a DRA 30.

Additionally, this study will compare the text level achievement growth of students—who participated in RR, LLI or a combination of both programs—when controlled for initial DRA level, gender, ethnicity, and free or reduced lunch rate.

The three categories of students will include those who participated in: a full, 14-20 week round of Reading Recovery only; a full, 14-20 week round of Leveled Literacy Intervention only; and finally a full 14-20 week round of Reading Recovery and a full 14-20 week round of Leveled Literacy Intervention.

Reading Recovery (RR) is a tier 3, one-on-one, intensive early literacy intervention program designed specifically for first-grade students. Reading Recovery was founded by Marie Clay in New Zealand and is based on a whole language approach to literacy instruction. Marie Clay focused on children who were about six or seven years of age because she discovered that young children may be able to more easily overcome their literacy struggles if they have practiced erroneous behaviors less often (Clay, 1979; New Zealand Ministry of Education on Reading Recovery, 2003). Therefore, Reading Recovery is implemented after children begin to fail, but before they have experienced too many failures and have established incorrect habits or patterns (Shanahan & Barr, 1995). RR lessons occur for 30 minutes a day (Rhodes-Kline, 1996) for an average of 20 weeks (RRCNA, 2013). Daily lessons include Fluent Writing, a Running Record on yesterday's New Book, Phonics, Writing, Reading a New Book at the child's instructional level, and assembling a Cut-Up Sentence (Clay, 2005). The routines are established but the

teacher is highly trained to follow the child's lead and to match what the child needs for acceleration throughout the lesson series.

When RR students conclude their round (cycle of intervention), students who are at the average level of their peers, as demonstrated by passing Clay's assessment *An Observation Survey in Early Literacy Achievement*, are discontinued (graduated) from the lesson series. Students who are not at the average level of their peers and do not pass *An Observation Survey in Early Literacy Achievement* are not discontinued and may receive a few more weeks of the RR intervention. However, many of the non-discontinued students are given "recommended action," which is a referral for additional services that likely will include special education services (Clay, 2007).

Leveled Literacy Intervention (LLI) is a tier 2 or tier 3, short-term, small-group (ideally three students) literacy intervention for students in grades K-3 (Fountas & Pinnell, 2009; http://www.heinemann.com/fountasandpinnell/lli_Overview.aspx, 2013). The goal of LLI is to get students to grade level proficiency before long-term literacy deficits are established (Harrison et al., 2008). LLI lessons are 30 minutes, five days a week in grades K-2, and 45 minutes, four days a week in third and fourth grades. The lessons last an average of 18-20 weeks (Fountas & Pinnell, 2013; Harrison, et al., 2008) but the program does not establish either a minimum or maximum number of weeks for participation. LLI is most commonly utilized as a tier 2 intervention (Fountas & Pinnell, 2013), but this study will look at its effectiveness as a tier 3 literacy intervention. Heinemann (2013), the publishers of LLI shared, "This short term intervention system can be used in different intensities and/or tiers,

depending on student need" (http://www.heinemann.com/fountasandpinnell/supportingMaterials/LLI_BAS_RTI_StudyDocument.pdf, Alignment of Instruction Approaches section, para. 5). For the purposes of this study, students who entered first grade with a DRA level in the DRA A – DRA 3 range are included and their Leveled Literacy Intervention participation will be considered a tier 3 intervention.

Statement of the Problem

Research continually affirms findings that emphasize the importance of literacy at every stage of life. Some children are not learning through tier 1 classroom instruction and this highlights the need for effective and affordable early literacy interventions. In 2010, 42 million Americans were "functionally illiterate" as defined by their inability to read, write, or perform simple math (Wooldridge, 2010). Princeton University's (2006) research into America's Future Children discussed the financial implications of not successfully completing high school. In 2006, earning a high school diploma resulted in a median annual earnings rate of $26,184 whereas high school dropouts who did not earn a GED had a median annual earnings rate of $17,703 (Princeton University, 2006).

Tivnan and Hemphill (2005) conducted a comparative analysis of students at 16 high-poverty elementary schools who made "good" efforts towards implementing a literacy intervention program. Tivnan and Hemphill (2005) shared that on fourth-grade reading assessments, 54% of children from high-poverty households scored at the "below basic" literacy level; whereas 23% of children not living in poverty scored

below a "basic" level. White, Graves and Slater (1990) found that, while there is a learning range in every grade level, economically disadvantaged first graders know an average of 2,900 words, whereas economically advantaged first graders know an average of 5,800 words. This gap between the economically disadvantaged and the advantaged students continues into adulthood, where more than 20% of American adults read at or below a fifth-grade reading level (National Institute for Literacy, 2001). With the cycle of illiteracy and economic instability, educators are charged with the mission to find early literacy solutions that will meet the needs of struggling readers and potentially provide the students with future opportunities to compete for jobs with a livable wage.

With that goal in mind, American school districts are turning to a variety of early literacy intervention programs to meet the challenging needs of their struggling readers. Response to Intervention (RtI) has established a multi-tiered approach to reading identification (Allington, 2013; rtinetwork.org, 2013). Tier 1 is the classrooms' first, best instruction. Tier 2 is targeted interventions for students who are not achieving grade level status from classroom instruction alone. Tier 3 interventions are intense and targeted at the students' specific skill deficits (rtinetwork.org, 2013). Examples of tier 3 interventions include: one-on-one tutoring with a teacher such as Reading Recovery, one-on-one tutoring with a paraprofessional such as Reading Rescue (Institute of Educational Services, 2009), and intensive small group instruction such as Leveled Literacy Intervention (Heinemann.com, 2013).

Knowing which intervention(s) will bring at-risk students to the grade level benchmark at the conclusion of first grade and provide students with the foundation

to maintain their growth through second grade will provide administrators with useful data upon which to base program decisions. Additionally, the same administrators need to know if there is a difference in text level achievement between the interventions, and if the differences vary when the data is controlled for initial DRA levels, gender, ethnicity, or free or reduced lunch rate.

Currently, the Reading Recovery early literacy intervention model is well researched and documented (Rodgers, Wang, & Gomez-Bellenge, 2004; Schwartz, 2005). However, there is a gap in the field of educational research because there is limited research and documentation on the Leveled Literacy Intervention model. Currently, research on LLI includes program effectiveness (Ransford-Kaldon, 2010; Ransford-Kaldon, Flynt, & Ross, 2011), the importance of staff development (Harrison, Peterman, Grehan, Ross, Dexter & Inan, 2008), and a comparative study between LLI and Scott Foresman's *My Sidewalks* (Murray, Munger & Hiebert, 2014). Interestingly, the study comparing the results of RR and LLI interventions has yet to be conducted.

Purpose of the Study

The purpose of this study was to determine whether a significant difference exists between academically at-risk first-grade students receiving Reading Recovery (one-to-one) and Leveled Literacy Intervention (small group) interventions in a large school district on end-of-year reading achievement and end-of-second-grade reading achievement as measured by the Developmental Reading Assessment (DRA).

Comparisons were controlled for spring of kindergarten reading levels, as well as gender, ethnicity, or free or reduced lunch rate.

Rationale

School districts are facing consistently shifting budgets (Minnesota Department of Education, 2011), and administrators are faced with decisions on how to best utilize their limited resources. This study looks at three early literacy interventions—Reading Recovery, Leveled Literacy Intervention, and a combination of both interventions—to investigate their ability to support tier 3 struggling students in their quest to reach the end-of-year grade level benchmark. Reading Recovery and Leveled Literacy Intervention were selected because they are both grounded in the whole-language approach and philosophy of Marie Clay. By investigating two programs with a similar ideology but varying approach—individual tutoring vs. small group instruction—district administrators throughout the United States will be able to determine which intervention(s) will likely be effective in their districts and, therefore, will utilize school district resources in a responsible manner.

Research demonstrates that the RR model is able to significantly raise the literacy levels of at-risk first-grade students (Center, Wheldall, Freeman, Outhred & McNaught, 1995; European Centre for Reading Recovery, 2012; Iverson & Tumner, 1993). Furthermore, students who successfully graduate from their lesson series consistently perform at the average literacy levels, including text level reading, of their peers beyond first grade. Among highly respected researchers and educators, the long-term effects of RR are generally thought to be favorable for maintaining the

average level of classroom achievement across the grades (Askew & Frasier, 1994; Center, et al., 1995; D'Agostino & Murphy, 2004; Gapp, 2006; Pinnell, 1989; Pinnell, DeFord & Lyons, 1988; Pinnell, Lyons, DeFord, Bryk & Seltzer, 1994; Reading Recovery Council of North America, 2013; Vaughn, 2011). However, D'Agostino & Murphy (2004) stated that realistically, some students will need additional support services to maintain their growth.

Many foundational studies have been conducted on the effectiveness of Reading Recovery (Askew & Frasier, 1994; Center, et al 1995; D'Agostino & Murphy, 2004; Gapp, 2006; Pinnell, et al., 1988; Pinnell, 1989; Pinnell et al., 1994; Reading Recovery Council of North America, 2013; Vaughn, 2011). The overall findings are positive. Despite its proven effectiveness, RR is often criticized for the expense of the program (Shanahan & Barr, 1995). These expenses include: on-going, extensive teacher training and staff development; one-on-one teacher for a 30-minute lesson, 5 days a week; program supplies and materials; district level Teacher Leader; membership in the Reading Recovery Council of North America; and an annual Reading Recovery conference attendance for the Teacher Leader and RR teachers (RRCNA, 2013).

Reading Recovery requires extensive and on-going staff development training for its teachers, and these expenses are depleting school budgets (Hiebert, 1994). Grossen, Coutler, and Ruggles (1997) claimed that it would be cheaper to educate a child for a full year in a traditional classroom than to provide the same child with 30 hours of Reading Recovery instruction. Yet, RR is designed for students who are not

reaching grade level benchmarks in the classroom despite their district's tier 1, first, best instruction (RRCNA, 2013).

"Reading Recovery is by far the most widely researched and widely used tutoring program in the world" (Slavin et al., 2009, p. 6). Research has demonstrated that the RR model is significantly effective at raising the literacy levels of at-risk first-grade students (Pressley, 2001; ReadingRecovery.org, 2014; RRCNA, 2013). Furthermore, students who successfully discontinued from their lesson series consistently performed at the average level, including text level reading, of their peers beyond first grade (Center, Wheldall, Freeman, Outhred & McNaught, 1995; European Centre for Reading Recovery, 2012; Iverson & Tumner, 1993).

Research Questions

During the course of this study, the following research questions guided the investigation:

1. For non-special education, tier 3 first-grade students, who participated in Reading Recovery, or Leveled Literacy Intervention, or a combination of both interventions: which of these three interventions have brought students to the end-of-first-grade Development Reading Assessment (DRA) benchmark when controlled for initial DRA level, gender, ethnicity, and free or reduced lunch rate?
2. For non-special education, tier 3 first-grade students who achieved grade level status during their first-grade year, after participating in Reading Recovery, Leveled Literacy Intervention, or a combination of both

programs: what percentage of students continued to reach the end-of-second-grade Development Reading Assessment (DRA) benchmark when controlled for initial DRA level, gender, ethnicity, and free or reduced lunch rate?

3. For non-special education, tier 3 first-grade students, is there a growth difference, as measured by a gain in DRA reading levels, in reading achievement based on their participation in Reading Recovery, Leveled Literacy Intervention, or a combination of both programs; when controlled for initial DRA level, gender, ethnicity, and free or reduced lunch rate?

Significance of Study

Due to the longevity and popularity of RR, a significant amount of data has been collected and research conducted on the program. However, very little research and data are available on the LLI program. Furthermore, there is a gap in the field of educational research because the study comparing the results of RR and LLI programs has yet to be conducted.

Peer reviewed research in the area of early literacy is an on-going and evolving topic of interest as new programs and approaches are sought by teachers, parents, and school district administrators. Reading Recovery is a well-established, well-researched, and respected program that seeks to meet the needs of struggling first-grade students. Leveled Literacy Intervention is a new program with a philosophy similar to Reading Recovery. However, Reading Recovery is a one-on-one application, and teachers are required to participate in extensive, on-going staff

development. Leveled Literacy Intervention has a similar philosophy but varies in its methodology. Leveled Literacy Intervention is a small group design, and teachers are encouraged to continue with staff development, but it is not a requirement of the program. There is a gap in research that compares the outcomes of the two programs with a similar philosophy but different methodology.

School districts question whether they should continue with Reading Recovery, if they should consider switching to Leveled Literacy Intervention, or possibly a combination of the two. Therefore, it is important to conduct a research study that looks at end-of-year outcomes for RR as compared to LLI. This study sought to discover the differences in student reading growth when controlled for initial DRA level, gender, ethnicity, and free or reduced lunch rate.

This research will assist school districts in their quest to provide students with effective early literacy interventions. District administrators and teachers will be equipped to make realistic and effective instructional decisions for the most at-risk, regular education students when they know the growth outcomes of student participation in Reading Recovery and Leveled Literacy Intervention.

Definition of Terms

"An Observation Survey in Early Literacy Achievement"- Marie Clay's selection process for deciding which first-grade children are to receive Reading Recovery supplementary reading and writing instruction. Teachers are introduced to methods for observing student literacy behaviors and learning about literacy instruction (Clay, 2005).

Basal Readers - Elementary level textbooks used to teach reading and literacy-based skills by combining stories with code-emphasis (phonics) practice. Basal readers or "readers" may include original works, narratives of various lengths, and short stories. Dick and Jane was the most famous basal reader (Graves, Juel, Graves, & Dewitz, 2011).

Consistently Performing or Achieving at Grade Level Status – Students who meet the grade level DRA benchmarks at the end of each trimester for their grade level. For first grade, the end of trimester 1 benchmark is a DRA 8, the end of trimester 2 benchmark is a DRA 14, and the end of trimester 3 benchmark is a DRA 18. For second grade, the end of trimester 1 benchmark is a DRA 24, the end of trimester 2 benchmark is a DRA 28, and the end of trimester 3 benchmark is a DRA 30.

Continuing Contact - A Reading Recovery term that refers to teachers who have previously completed their initial training year. Continuing contact sessions provide collaborative opportunities for teachers to remain responsive to individual children, to question the effectiveness of their practices, to get help from peers on

particularly hard-to-teach children, and to consider how new knowledge in the field may influence their practice (rrcna.org).

Developmental Reading Assessment - The Developmental Reading Assessment (DRA), designed by Joetta Beaver (1999), is an individually administered assessment of a child's reading capabilities. This tool is to be used by teachers to identify a student's reading level, accuracy, fluency, and comprehension. Once levels are identified, the teacher can use this information for instructional planning purposes (scholastic.com).

Discontinued - A Reading Recovery term that refers to students who complete a full 12-to-20 week intervention cycle and meet grade-level expectations in reading and writing at the completion of their Reading Recovery intervention. Since 1984, internationally approximately 75% of Reading Recovery students are discontinued (rrcna.org).

Leveled Literacy Intervention - The Leveled Literacy Intervention System (LLI) is a small-group, supplementary literacy intervention program that was designed by Gay Su Fountas & Irene Pinnell with the purpose of helping teachers provide a daily, small-group intervention for the lowest achieving students (heinemann.com/fountasandpinnell).

Non-Discontinued - A Reading Recovery term that refers to students who, after completing a full 20-week cycle of Reading Recovery intervention, are still struggling in the areas of reading and writing. Students are usually referred for

additional services, including: classroom interventions and support, Title I services, and/or Special Education services (readingrecovery.org).

Reading Recovery - Reading Recovery (RR) is a short-term intervention for first graders who are significantly below grade level in reading and writing. Specially trained RR teachers work individually with students in daily 30-minute lessons lasting from 12 to 20 weeks. After a full series of lessons, internationally about 75% of students reach their grade-level benchmark (rrcna.org).

Reading Interventions - A reading intervention is a program, supplementary to an existing literacy curriculum, which is provided to students for the primary purpose of increasing reading levels.

Response to Intervention (RtI) - Schools identify students at risk for poor learning outcomes, monitor student progress, provide evidence-based interventions, and adjusted the intensity and nature of those interventions depending on a student's responsiveness, and identify students with learning disabilities or other disabilities. RtI established a three-tier system to identify the needs of students (NCRTI, 2010; NICHCY, 2012). Tier 1: At-risk children who have been identified through a screening process receive research-based instruction, sometimes in small groups, sometimes as part of a class-wide intervention. Tier 1 includes the classroom's first, best instruction. Tier 2: At-risk children who are not meeting grade-level benchmarks through Tier 1 classroom instruction are placed in small group interventions. Tier 3: The most extensive intervention for students who are at a high risk for academic failure. The instruction may be one-on-one or small group instruction. If students are

not responsive to the literacy interventions, they will likely be considered candidates for special education services (District website, 2013; IDEA.gov, 2013; and Shapiro, 2013).

Scripted Lessons - Reading instruction where the commercial reading program, not the teacher, determines what the teacher says during instruction. The reading program also dictates the lesson pace, content flow, and content trajectory.

Text Level Growth - Measurement of the gradient of reading difficulty based on accuracy, comprehension, fluency, and often speed in reading. When a child scores 90+% accuracy, as well as passing scores in fluency and comprehension, they advance to the next DRA text level. When a child participates in an intervention program, text level growth compares a child's initial DRA score to his/her final DRA score. The number of DRA levels a child advances is referred to as the child's text level growth (Murray, Munger & Hiebert, 2014; rrcna.org; scholastic.com).

Assumptions and Limitations

This study looked at student achievement as a result of participation in two popular early literacy interventions. Specifically, the study analyzed whether or not the participants are able to achieve the end-of-grade-level benchmark after completing a round (lesson series) of Reading Recovery, Leveled Literacy Intervention, or a combination of both RR and LLI. The most important assumption is that the school district under study provides Reading Recovery and Leveled Literacy Intervention instruction that preserves program fidelity to the best of its ability.

In the field of learning we acknowledge the human variable. Family background and prior exposure to academics and social relationships have a profound influence on a child's foundational readiness for kindergarten (West, Denton, Germino-Hausken, 2000). Fagan and Lee (2013) found that preschool children of adolescent parents scored lower on emerging literacy and math assessments than children of adult parents. Additional family dynamics that often affect a child's school readiness include: the educational level of the mother; family's socio-economic status; mother's primary language; if the mother was married at the time of the child's birth; and if the child was raised in a single or dual parent household (Zill, Collins, West & Hausken, 1993, 1995). For the purposes of this study, children's socio-economic status were determined by whether or not the child received a free or reduced lunch rate or if they paid full price for their lunch. For the 2011-12 school year, the federal poverty guidelines for a family of four living in the contiguous

United States were $22,350 (USDA, 2014). Therefore, a family of four could have made a maximum annual household income of $41,348 to qualify for the reduced lunch rate and a maximum annual household income of $29,055 to qualify for a free lunch (USDA, 2014).

This study was conducted with the assumption that all intervention teachers will use their training well and teach to the best of their abilities. For example, the Reading Recovery program requires highly skilled, highly trained, and highly motivated teachers. For the purposes of this study, all RR teachers were Continuing Contact Teachers, meaning that they will have completed their initial Reading Recovery training year. The Leveled Literacy Intervention program does not require, but encourages, on-going professional development for teachers. For the purposes of this study, LLI teachers were provided with half-day staff development training sessions throughout the course of the students' first-grade year, but their ability to teach LLI does not require their participation in the training. A limitation may be that due to the lack of rigor and training expectations, the Leveled Literacy Intervention teachers may not have the same depth of literacy training that the RR teachers possess.

Another assumption of this study was that there will be a range of abilities, as well as a combination of early and late developers, amongst students in all interventions groups. All students will begin their first-grade year as tier 3, non-special education students but their initial DRA levels may range from DRA A/.5 – DRA 3. Based on spring Kindergarten DRA levels, the study found that 71.4% of all participants had an initial DRA level in the above-mentioned range. Participants

whose initial DRA exceeded the range were second round students and their tier 3 status was based upon their lack of progress during the first half of their first-grade year. Since this study utilized secondary data, it is not possible to make adjustments to the intervention groups for the potential purpose of equalization.

A final assumption will be that first-grade children are at the beginning of their reading journey, and children develop at differing rates (Fredrick, Keel & Neel, 2002). The National Assessment of Educational Progress (U.S. Department of Education, 2013) revealed that 37% of American fourth graders fail to achieve basic levels of reading benchmarks. The incidence of reading failure is even greater among groups that include low-income families, ethnic minorities, and English language learners. Furthermore, large-scale studies have shown that young children in kindergarten and first grade vary significantly in their attainment of the early precursor skills that provide the launching pad for later literacy learning (National Institute for Literacy, 2008; West, Denton & Germino-Hausken, 2000; West, Denton & Reaney, 2000).

An important limitation of the study is the classroom instruction each of the students receives. The district guidelines mandate that classroom instruction is every student's first and best instruction (District, 2013). However, in a practical world we know that there is a range of training, ability, and overall skills among any district's teaching staff (McBer, 2000; McCaffrey, Lockwood, Koretz & Hamilton, 2003). While these factors have a tremendous impact on student achievement and growth, the methodology of this study is not able to account for these variables.

An additional limitation is that the Developmental Reading Assessment (DRA) has high inter-rater reliability, but there is space for subjectivity. Teachers administering the assessment ask questions about the reading to determine the child's comprehension of the text. Additionally, teachers determine the child's fluency rating based on their interpretation of the reading. However, the subjectivity risk is minimized through teacher training and by the number of teachers providing the assessments.

A major limitation of this study was student selection. Students are not placed into literacy intervention groups via random selection but rather building level Reading Recovery and Supplemental Programs teachers assigning the participants. In the spring of the kindergarten year, kindergarten teachers provide Reading Recovery teachers with a ranked list of classroom students. In the fall of the participants' first-grade year they are given a DRA assessment. The building Reading Recovery teacher ranks all students who test at a DRA 3 or below. The bottom 20% of students are then given Marie Clay's "An Observation Survey" to determine which students, in the bottom 20%, will make optimal candidates for the Reading Recovery program. Since RR teachers may only select four students, participation considerations include: reading ability, risk-taking behaviors, classroom teacher support, and parent agreement to complete nightly homework throughout the course of the Reading Recovery round. Leveled Literacy Intervention participants are then selected from the pool of students not selected for Reading Recovery, by the Supplemental Programs (Title I) teacher for participation in LLI. Students are selected according to DRA scores, classroom schedule, Supplemental Programs teacher availability, and

continuity amongst group members. In January of each year, the process is repeated and a new round of participants is selected for each intervention. It is feasible that a first-grade student who is not selected for the fall round of RR will receive a lesson series of LLI and then be selected for RR in January. It is also feasible that a first-grade student is selected for the fall round of RR and is then placed in an LLI group to scaffold the level of support (District Representative, 2013, 2014).

Teachers vary in their abilities, experiences, and educational backgrounds (McBer, 2000; McCaffrey, Lockwood, Koretz & Hamilton, 2003). An important limitation of the study was the classroom instruction each of the students receives as a first- and/or second-grade student. The district guidelines mandate that classroom instruction is every student's first and best instruction (District, 2013). While the classroom teacher has a tremendous impact on student achievement and growth, the methodology of this study was not able to account for these variables.

A final limitation may be that this study evaluated only one school district. However, the size of this district allows for many socio-economic variations and dynamics. It is anticipated that the final results may not be relevant for all districts. School districts with a Midwestern geographical location and similar demographic features, including socio-economic status will likely find the results most relevant and applicable.

Nature of Study

This is a non-experimental study based on existing reading test scores for first- and second-grade students in a large suburban school district. Achievement of

grade level benchmarks were described and analyzed for non-special education students in two reading intervention programs, as well as those receiving both interventions. Reading achievement scores were compared for students in the three intervention groups—controlling for initial DRA level, gender, ethnicity, and free or reduced lunch rate.

Organization of the Remainder of the Study

Chapter II of the study looks at the current research in the area of reading and specifically in the area of early literacy intervention. Chapter III discusses the quantitative study procedures and ethical considerations. Chapter IV discusses the results of the study. Finally, Chapter V discusses the implications of the study and includes recommendations for future studies.

Chapter Conclusion

School districts are consistently looking for strategic ways to evaluate their literacy curricula and to make informed decisions based upon current research. This study had three main purposes: (1) to determine which first-grade literacy interventions are effective for non-special education, tier 3 struggling readers; (2) to determine for those students who achieved grade level status as a result of first-grade literacy interventions, the study continued to measure the program's effectiveness by following the students through the spring of their second-grade year to determine if they were able to maintain their grade level status; and (3) to compare achievement levels, through text level growth, based upon participation in Reading Recovery, Leveled Literacy Intervention, or a combination of both interventions.

Chapter II: Review of Literature

Introduction

Educators are aware that providing early interventions for struggling readers is crucial to their future academic success. For many, it is an indicator of a student's future success or failure in life. Children who are not reading proficiently by fourth grade are four times more likely to drop out of high school (NAEP, 2012). Currently, 34% of America's fourth graders are reading below grade level (NAEP, 2013). In the United States, prison officials are currently using third-grade reading data as an indicator of future prison populations (Perry, 2013).

In 2008, the National Institute for Literacy commissioned a scientific synthesis report of Early Literacy Development and Implications for Intervention. The report found that six factors found in children aged birth to five years old are predictors for later reading, writing, and spelling. The six factors are: alphabet knowledge, phonological awareness, rapid automatic naming of letters or digits, rapid automatic repeating of a sequence of pictures of objects or colors, writing letters in isolation and writing their own names, and phonological memory (ability to remember spoken information for a short period of time) (Shanahan, Cunningham, Escamilla, Fischel, Landry, Lonigan, Molfese, Schatschneider & Strickland, 2008).

American educators are spending a significant amount of resources on the research, analysis, and evolution of literacy for the betterment of their youth and, ultimately, their entire society.

This chapter reviews literature in the area of early literacy intervention. The first section contains a full narrative of the history of reading in American schools. This is followed by more recent endeavors to assist children at risk for not being proficient readers. The review of literature concludes with full descriptions of Clay's Reading Recovery and Fountas' and Pinnell's Leveled Literacy Intervention. RR and LLI are early literacy interventions that are grounded in a whole language approach and have broadened into a balanced literacy approach to include a phonics component (Clay, 1987, 2001; Fountas & Pinnell, 2009 & 2013).

History of Literacy Instruction in America

To establish the evolution of reading in the United States, a full narrative of the history of reading is provided. The narrative will begin with the colonial period, move through basal readers, discuss the reading wars, and conclude with modern-day balanced literacy.

Colonial Period & the 19th Century

Early literacy began with the Colonial Period and continued through the 19th Century. This period extended from roughly 1600 to 1840, with an emphasis on content. The period was relatively free from tensions over instructional practices. The early years primarily focused on religious instruction; and the latter years, from

the American Revolution through1840, primarily focused on patriotism. The instructional approach was the alphabetic-spelling method. Students learned the alphabet, learned how to spell a large number of syllables, spelled words and read them, and memorized text with an emphasis on oral reading (Graves, Juel, Graves & Dewitz, 2011; Peterson, 1983).

The 20th Century & Beyond

Beginning in the early 1900s, basal readers made a significant impact on reading instruction. Basal readers are elementary level textbooks used to teach reading and literacy-based skills by combining stories with code-emphasis (phonics) practice. Basal readers or "readers" may include original works, narratives of various lengths, and short stories. Dick and Jane was the most famous basal reader (Graves, Juel, Graves, & Dewitz, 2011). The basal reader period developed and introduced teacher manuals and scopes and sequences to guide instruction. In time, schools began investing in large collections of books, teacher manuals, worksheets, standardized tests, and supplementary materials. Research was conducted on word fluency in the English language, which led to a carefully controlled vocabulary in basal readers (Graves et al., 2011; Hoffman, Sailors, & Patterson, 2005; Pennsylvania State University, 2014).

The introduction of basal readers into the American educational system was not without disagreements. Controversies of the period focused on the "phonics method" which segmented instruction and centered on letters, sounds, and words versus the holistic "whole-word" or "whole-language" method that focused on quality

literature and developing a love of reading (Harste, 1989; Hoffman, Sailors, & Patterson, 2005; Weaver, 2002). Eventually, the debate became so fierce that it was commonly referred to as "the Reading Wars" (Hoffman, Sailors, & Patterson, 2005; Kim, 2008).

The whole-language approach is a constructivist approach, whose philosophy is complex and rooted in education, linguistics, psychology, sociology, and anthropology (Bomengen, 2010). Students are given the opportunity to create or construct knowledge based on their personal encounters. Constructivist teachers view learning to read as an experience that is unique to each learner and is based on perspectives and prior knowledge, ultimately forming the framework for the new knowledge that children will acquire (Bomengen, 2010).

As of 2010, 74% of American schools and teachers use a basal reader to some extent, either in part or whole, as a component of their literacy curriculum (Dewitz & Jones, 2013; Education Market Research, 2010).

Federal Intervention

The National Institute of Child Health and Human Development (NICHD) focused on young children who are having difficulty learning to read. Their primary focus was on beginning skills such as phonemic awareness and phonics (Langenberg et al., 2000). In 1998, the National Research Council, a prestigious scientific group published *Preventing Reading Difficulties in Young Children* (Snow, Burns and Griffin, 1998). This report led to the creation of the National Reading Panel's *Report of the National Reading Panel: Teaching Children to Read* (Langenberg et al., 2000).

The National Reading Panel (2000) found that students develop a sense of story and comprehension through quality literature. Therefore, tutoring activities that focus on comprehension as their ultimate goal lead to increased student interest and motivation (Langenberg et al., 2000).

The National Reading Panel (2000) stated that the five essential pillars for early literacy should be: phonemic awareness, phonics, fluency, vocabulary, and comprehension. Phonemic awareness is commonly defined as the understanding that spoken words are made up of separate units of sound that are blended together when words are pronounced. Phonics is the understanding about how written language was created. It is defined as a set of rules that specify the relationship between letters in the spelling of words and the sounds of spoken language (Langenberg et al., 2000). Fluency is recognizing the words in a text rapidly and accurately and using phrasing and emphasis in a way that makes what is read sound like spoken language (Langenberg et al., 2000; Rasinski, 1990). Vocabulary refers to the words we need to know in order to communicate with others. The four types of vocabulary include listening, speaking, reading, and writing. Comprehension involves constructing meaning that is reasonable and accurate by connecting what the reader has read to background knowledge the reader has and is thinking about (Langenberg et al., 2000).

Reading First Grants promote instruction in each of the five essential components as specified by the National Reading Panel (2000). Funding is given to state educational systems, and the states distribute the funds to local educational systems. Grants are primarily awarded to schools, on behalf of students with a low

socio-economic status, but the guidelines vary by state (Reyhner, 2008; U.S. Department of Education, 2013).

Guided Reading

Fountas and Pinnell (1998) set out to create an organized way of thinking about the three contexts of learning, which are reading, writing, and word study. Each context provides children with the opportunity to explore words and learn about them in a different way. Fountas and Pinnell advocated that all three components are necessary to provide effective literacy instruction.

The guided reading teaching approach is designed to help individual students learn how to process a variety of increasingly challenging texts with understanding and fluency. Guided reading occurs in a small-group setting because this allows for interactions among readers that will benefit the individual students and the entire small group. The teacher selects and introduces the text, occasionally supports the students while reading the text, engages the readers in a discussion relevant to the reading, and makes teaching points immediately after the reading. Some lessons will include writing about the reading (Fountas & Pinnell, 1996, 2001; Underwood, 2010).

Common Core State Standards

Between 2010 and 2013, state legislatures in 45 states, the District of Columbia, and four United States territories approved and adopted the Common Core State Standards (CCSS) for English Language Arts. This event is unprecedented in

American history and is currently shaping instructional and assessment policy (corestandards.org;).

The CCSS for English Language Arts is broken down into six strands: Reading Literature, Reading Informational Text, Reading Foundations, Writing, Speaking and Listening, and Language. The purpose of the CCSS is solely to "…define what all students are expected to know and be able to do, not how teachers should teach" (corestandards.org, CCSS, p. 6).

Previously, the National Reading Panel (2000) stated the five pillars of early literacy instruction are: phonemic awareness, phonics, fluency, vocabulary, and comprehension. With the implementation of the CCSS in 2012, comprehension has been thrust forward to a more prominent position (Williams, 2013). Even for the youngest readers, the Common Core pushes students to read for meaning. Clay (1998) shares that meaning and comprehension are what drives all literacy tasks. "This shift in focus means a few things. One is that classrooms (or states) that have coasted on low-level reading skills need quickly to get on board with high-level reading skills" (Calkins, Ehrenworth & Lehman, 2012, p. 29). Second, schools will need to increase the amount of informational texts students are reading. Third, classes will spend a greater amount of time exploring fiction and non-fiction texts at greater levels of depth since meaning drives all literacy tasks (Williams, 2013). Students will be expected to navigate a greater number of texts at higher levels, through teacher supported scaffolding and prompting (CCSS, 2012; Williams, 2013).

The Reading Recovery (Williams, 2013) and Leveled Literacy Intervention approaches to early literacy intervention align closely with CCSS (2012). Reading, writing, and oral language are key components of Reading Recovery (rrcna, 2013) and Leveled Literacy Intervention (Harrison et al., 2008). The CCSS are divided into five strands that include components of reading fiction and non-fiction texts, writing, and speaking and listening (CCSS, 2012).

Reading Standards for Literature. RR students are instructed in the art of asking and answering questions about key details in text. Many of the texts are "series books," and through discussions and writing, students are able to compare and contrast the variety of adventures the characters embark upon.

Students are instructed at appropriate leveled text as they work towards meeting grade level benchmarks. Instruction includes: asking and answering questions, retelling stories, making connections, comparing and contrasting characters' adventures, and using the illustrations to support comprehension.

Reading Standards for Informational Text. Students are exposed to a variety of appropriate informational text. Instruction includes: asking and answering questions, exploring text features, using illustrations and details to describe key ideas, and identifying details of the main topic.

Reading Standards for Foundational Skills. Students demonstrate understanding of the foundational literacy skills: Print Concepts (understanding of basic print features), Phonological Awareness (understanding of spoken words, syllables, and sounds), Phonics and Word Recognition (knowing and applying grade

level phonics and word analysis skills), and Fluency (achieving sufficient accuracy and fluency to support comprehension) (CCSS, 2012, 2013; Fountas & Pinnell, 2013; RRCNA, 2013; Williams, 2013).

Reading Intervention Programs

The American school system is filled with a variety of approaches to early literacy. In 2009, the Institute of Education Services, a division of the U.S. Department of Education, conducted a research synthesis of the most effective literacy programs (U.S. Grant number R305A040082). The research findings stated that the following programs have strong evidence of effectiveness: Success for All, Corrective Reading (Direct Instruction), Peer Assisted Learning Strategies (PALS), Reading Recovery, Targeted Reading Intervention, and Quick Reads (Slavin, Lake, Davis, & Madden, 2009, 2011).

Success for All

This literacy intervention program takes a full-school approach to literacy intervention and instruction. Trained supplemental teachers and paraprofessionals meet individually with all students who are below their peers for a 20-minute, daily tutoring session. All instruction reteaches the exact literacy strategies and skills that are being taught in the classroom. This approach resulted in significantly positive results on all reading measures on standardized tests (McKenna, 2008; Slavin, 1996).

Corrective Reading (Direct Instruction)

The most common form of remedial or supplementary instruction for struggling readers is additional teaching in small groups, typically 30-45 minutes daily (Slavin et al., 2009). Direct Instruction is a highly structured phonetic approach to reading instruction. Sessions in the Corrective Reading approach last for 50 minutes, 5 days a week, over a 5-10 month period. In 2008, a study was conducted on eight-to-eleven-year-old struggling readers in Australia. The students either received Corrective Reading (n=134) or no remedial services (n=72). After seven months, on Woodcock Word Attack measures, adjusted for pretests, the effect size was +1.22 ($p<.001$) (Hempenstall, 2008; Slavin et al., 2009).

Peer Assisted Learning Strategies (PALS)

The PALS approach to supplementary literacy instruction varies significantly from traditional models. Students are grouped into pairs and take turns being the teacher and the student. They work together to learn a structured sequence of literacy tasks in: phonemic awareness, phonics, sound blending, passage reading, and story retelling. In 2001, Mathes and Babyak conducted an evaluation of PALS. Over a 14-week period, 12 classes were assigned to PALS and twelve comparison classes were matched to them. Adjusting for pretests, the effect-size on the Woodcock Letter Identification test was +0.42; Woodcock Word Attack was +0.58; Woodcock Basic Skills was +0.55; and the Woodcock Passage Comprehension was +0.50

Reading Recovery

Slavin et al. (2009) stated that one-on-one tutoring is the "gold standard" of reading instruction for struggling readers but that it is also the most expensive option. Reading Recovery begins when a child is about six years old, provides intensive one-on-one tutoring instruction, focuses on the child's strengths rather than the child's deficits, immerses the child in reading and writing, expects the lowest achievers to demonstrate accelerated progress, and expects the teacher to adjust the program to meet each child's individual needs while capitalizing on the child's strengths (Pinnell, 1989).

Targeted Reading Intervention (TRI)

Targeted Reading Intervention is also a one-on-one tutoring model. Classroom teachers in kindergarten and first grade work with students on fluency (two minutes), word works (six minutes), and guided oral reading (seven minutes) for a total of 15 minutes per day. Two quasi-experimental evaluations were conducted on TRI. The first experiment showed +0.25 mean on the Woodcock Letter-Identification, when adjusted for pretests (Slavin et al., 2009; Vernon-Feagans, Amendum, Kainz, Ginsberg, & Bock, 2009).

Quick Reads

Quick Reads provides tutoring dyads that focus on repeated readings, letters and sounds, and comprehension for struggling readers. In 2008, Vadasy and Sanders conducted a research study on second and third grade struggling readers who received

tutoring for 30 minutes a day, four days a week. It is important to note that Quick Reads tutoring is primarily offered by trained paraprofessionals. On the Woodcock Word Identification test, adjusted for pretests, the effect size was +0.27 (Slavin et al., 2009; Vadasy & Sanders, 2008).

Interventions Utilized by District Under Study

Reading Recovery and Leveled Literacy Intervention are grounded in Marie Clay's exhaustive work in early literacy. Marie Clay is the creator of the RR program, and she acted as a key mentor for Irene Fountas and Gay Su Pinnell, who decades later created the LLI system for small groups. Both RR and LLI are grounded in an internationally recognized whole language approach to early literacy (RRCNA, 2013).

Children begin their learning journeys in a variety of places. Their background, knowledge, and exposure to books and oral language vary greatly amongst students (Clay, 2001, 2005a; RRCNA, 2013; Watson & Askew, 2009). Children enter the literacy learning process with differing profiles of competencies, and they take unique paths to common outcomes of learning (Clay, 2001, 2005a; RRCNA, 2013; Watson & Askew, 2009). Teachers must maximize each child's literacy repertoire through the use of their individual strengths. Teachers who are skilled at this process are able to best accelerate their students' learning (Clay, 2001, 2005a; Grehan et al., 2007; RRCNA, 2013; Watson & Askew, 2009).

Learning to read and write is a complex problem-solving process for children (Clay, 2001). They naturally create a continuous cycle of learning: collect and use

information from a variety of sources, make decisions, and evaluate their response to the information. Readers and writers constantly make "in-the-head" strategic decisions to solve problems at the point of difficulty (Clay, 2001, 2005a; RRCNA, 2013; Watson & Askew, 2009).

Reading and writing are reciprocal and concurrent sources of learning. Together they build a child's reading and writing abilities (Clay, 2001, 2005a; RRCNA, 2013; Watson & Askew, 2009). Readers read continuous text; they do not simply read just letters, sounds, or words in isolation. The integration of many behaviors is essential for meaningful written communication (Clay, 2001, 2005a; RRCNA, 2013; Watson & Askew, 2009).

Processing systems are continuously changing as children learn to read and write over time (Clay, 2001, 2005a). Teachers must carefully observe these changes and allow the new information to inform their instruction. Reading Recovery teachers are required to make daily notes of a child's literacy behaviors. This practice is encouraged but not required of LLI teachers (Clay, 2001, 2005a; RRCNA, 2013; Watson & Askew, 2009). Teachers must support children as they use all of their abilities to actively work on printed messages. Teachers should employ strategic and focused prompting to advance the child's learning (Clay, 2001, 2005a; RRCNA, 2013; Watson & Askew, 2009).

Children who take advantage of the opportunities around them to read, compose, and write messages will dramatically improve their literacy processing. In support of their students, teachers should provide a variety of appropriate leveled

texts (Clay, 2001, 2005; Jones & Smith-Burke, 1999; Schmitt, Askew, Fountas, Lyons & Pinnell, 2005; Watson & Askew 2009).

Reading Recovery

Marie Clay received a Fulbright Scholarship to study at the University of Minnesota (http://rrcna.org, 2014). It was during this time period that she created the Reading Recovery early literacy intervention program, based on the needs and structure of the New Zealand public school system. In the 1980s the Reading Recovery program was adapted for implementation in the United States, and during the 1985-86 school year the first American Reading Recovery training class was offered at The Ohio State University (osu.edu, 2014). Today, Reading Recovery is successfully implemented in eight countries throughout the world (http://readingrecovery.org, 2014).

"Reading Recovery is by far the most widely researched and widely used tutoring program in the world" (Slavin et al., 2009, p. 6). Research has demonstrated that the RR model is significantly effective at raising the literacy levels of at-risk first-grade students (Pressley, 2001; ReadingRecovery.org, 2014; RRCNA, 2013). Furthermore, students who successfully discontinued from their lesson series consistently performed at the average level, including text level reading, of their peers beyond first grade (Center, Wheldall, Freeman, Outhred & McNaught, 1995; European Centre for Reading Recovery, 2012; Iverson & Tumner, 1993). While some researchers (Shanahan & Barr, 1995) have questioned the cost of RR, Johnston and Allington (in Barr, Kamil, Mosenthal & Pearson, 1991) stated "Reading

Recovery is the most effective remedial intervention currently available (p. 1006). Among highly respected researchers and educators, the long-term effects of RR are generally thought to be favorable for maintaining the average level of classroom achievement across the grades (Askew & Frasier, 1994; Center, et al., 1995; D'Agostino & Murphy, 2004; Gapp, 2006; Pinnell, DeFord, & Lyons, 1988; Pinnell, 1989; Pinnell, Lyons, DeFord, Bryk & Seltzer, 1994; Reading Recovery Council of North America, 2013; Vaughn, 2011). Realistically, some students will need additional support services to maintain their growth (D'Agostino & Murphy, 2004).

An Evaluation of Reading Recovery and At-Risk Learners

In 2010 the United States Department of Education provided Reading Recovery with a $45 million grant as part of the 2010 economic stimulus package. Together with an additional $10.1 million from private sources, the package became known as the "i3 Grant." During the 2011-12 school year, 2,000 schools were provided grant funds, which allowed 88,000 first-grade students to receive Reading Recovery instruction. The program teachers and teacher leaders demonstrated that they provided program fidelity, and nationally students who received Reading Recovery as part of the i3 grant ranked in the 36th percentile on the Iowa Tests of Basic Skills (ITBS), whereas the control group ranked in the 18th percentile. It is estimated that the standard effect of Reading Recovery on students' ITBS Total Reading Score was .68 standard deviation relative to the population of students who were eligible to receive Reading Recovery services. Additionally, the RR participants achieved .47 standard deviations relative to the national population of

first graders (May, Gray, Gillespie, Sirinides, Sam, Goldworthy, Armijo & Tognatta, 2013).

Between the years of 1993-2000, the Sioux Falls, South Dakota, school district conducted an eight-year longitudinal analysis of Reading Recovery (Homan, 2002). The study found that approximately 80% of discontinued RR students continued to perform at or above grade level, as measured by the Stanford Achievement Test Nine Edition. The Reading Recovery participants during the 1993-94 school year, and who are still in the Sioux Falls School District, show an up trend of reading achievement data. In fifth grade the students' average score was 82; in sixth-grade it was 86.5; in seventh-grade it was 85.2, and in ninth-grade it was 90.9 (Homan, 2002).

Center, Wheldall, Freeman, Outhred and McNaught (1995) conducted an experimental evaluation of Reading Recovery. While Marie Clay's (1985, 1991) data showed that students who participate in the Reading Recovery program make significant gains on the pre- and post-Diagnostic Survey (later renamed *An Observation Survey in Early Literacy Achievement*), there is a lack of evidence on student progress when given pre- and post-evaluations other than the Diagnostic Survey. For their research, Center, et al. (1995) selected 119 of the lowest achieving Year 1 students from the ten Australian metropolitan public schools where RR was in operation. The students were randomly divided into three groups: (1) the Reading Recovery group (n=31); (2) the control group which consisted of low achieving students at the above mentioned schools (n=39) and; (3) the comparison group which

consisted of students from area schools where Reading Recovery is not offered (n= 39). Once the students were divided into groups, they were given a variety of literacy assessments. The authors concluded that low-progress students, who received 15 weeks of RR, outperformed their control counterparts on Clay book-level and Burt word-reading tests. Additionally, the low-progress students outperformed their control peers on all Set 2, reading and writing words in isolation, tests.

Considering the work of 36 studies similar to Center et al. (1995), D'Agostino and Murphy (2004) conducted a meta-analysis of Reading Recovery in American Schools. Despite widespread research on the early intervention program, the overall effect of RR on the participants' reading levels remained elusive due to issues with methodology, equivalent comparison groups, the program's student selection and attrition policies, and problems inherent with accurately measuring first grade students' achievement levels. After a rigorous analysis was conducted, 36 studies met the inclusion criteria. This created 1,379 effect sizes across the outcome type, comparison-group (CG) type, treatment-group (TG) type, and test time. For Analyses I, D'Agostino and Murphy (2004) created a comprehensive descriptive evaluation of RR by compiling data from all 36 studies. For Analyses II, D'Agostino and Murphy (2004) only looked at studies that included both a CG and pre-test and post-test scores for all participants. On post-test standardized assessments, findings showed that discontinued (graduated) participants significantly outperformed similar under-achieving but not average students, outperformed average students on three Observation Survey (OS) measures, and outperformed similar needy participants on all six tasks of the OS. Upon a second-grade follow up, discontinued and all TG

participants outperformed similar needy students on Standardized Achievement tests. However, D'Agostino and Murphy (2004) found that realistically, many of the RR students would need additional services in order to maintain classroom level achievement beyond first or second grade. It was concluded that most evidence indicates that the RR program has had positive effects on participants across outcomes both designed for the program and beyond the program's specific measures.

The year before D'Agostino and Murphy (2004) published their work, the New Zealand Ministry of Education on Reading Recovery (2003) commissioned a nationwide study on the effectiveness of Reading Recovery. In 2003, RR was implemented in 67% of the nation's state primary schools. The study collected and analyzed data on all aspects of RR, including student demographics, program costs and effectiveness, teacher preparation, and school-wide commitment to the program. The survey concluded that the ideal age for participation is between the ages of 6.0 and 6.5 years, with the lowest achieving participants experiencing the greatest gains over a greater number of weeks. Principals across all school types reported the program to be an efficient, cost-effective early literacy intervention. Schoolwide, RR is highly supported, and multiple schools are calling for RR teacher training among non-RR teachers.

Just like the New Zealand Ministry of Education (2003), Shanahan and Barr (1995) wanted to explore the program effectiveness of RR. Shanahan and Barr published an independent evaluation that systematically analyzed all available empirical work on RR in order to answer the question, "Does Reading Recovery

work?" Therefore, program participants included discontinued and non-discontinued RR students from previously reported studies and technical reports. The researchers pooled the existing data in order to increase the reliability of the estimate and limit biases. The results indicate that the average discontinuing RR student makes "dramatic progress" (Shanahan & Barr, 1995, p. 966) during first grade, including gains over non-RR students attending the same schools. The data indicates that RR students made greater gains than their non-RR counterparts. Other researchers have recently developed early literacy intervention programs that attempt to capitalize on the successes of RR, including their high maintenance and transference scores. In conclusion, Shanahan and Barr found that many RR students were brought to the average levels of their classrooms and that the gains were maintained in their classrooms.

While others (D'Agostino & Murphy, 2004; Vaughan, 2011) focused specifically on the lasting impact of RR, Pinnell (1989) conducted a descriptive statistical pilot study analysis that looked at how Reading Recovery compared to traditional solutions that address reading difficulties in struggling first-grade students. The overall objective of the research was to determine whether RR had been effectively implemented and what organizational requirements the program needed for success. One hundred ten children from six urban Midwestern United States schools with high proportions of low-income students were selected to participate in the study. The lowest students in the program classrooms were placed in the Reading Recovery group (n=55) while the lowest students in comparison classrooms (where RR was not offered) comprised the comparison group (n=55). RR and comparison

group (CG) students were given Clay's Diagnostic Survey (Letter Identification, Basal Word Test, Concepts About Print, Writing Vocabulary, Dictation Task and Text Level Reading) in October, December, and when the lesson series was completed in May. RR and CG students began the year with similar test results on all batteries of the Diagnostic Survey. In May, the two groups maintained this status on the Letter Identification and Basal Word Tests, but the RR students significantly outperformed the CG on the Concepts About Print, Writing Vocabulary, Dictation Task, and the Text Level Reading. Additional follow up tests of participants still in the schools were conducted for the next two years to determine if the RR participants (n=44) maintained their edge over the CG (n=33). At the end of the second year, students were assessed on six dependent measures. In all areas, the RR participants outperformed the CG. At the end of the third year, students were assessed on Text Level Reading, and the RR participants significantly outperformed the CG. RR had a mean text level of 19.82 whereas the comparison group had a mean text level of 17.70. The evidence from this study, including the initial year and two follow-up years, indicates that RR has had positive outcomes for students who were initially identified as being at-risk for reading failure. The findings showed that minimally two-thirds of students who received a full RR round made accelerated progress and performed within the average range of their classroom peers (Pinnell, 1989).

Significant research (Center, et al., 1995; D'Agostino & Murphy, 2004; New Zealand Ministry of Education on Reading Recovery, 2003; Pinnell, DeFord, Lyons, & Bryk, 1995; Rasinski, 1995; Shanahan & Barr, 1995; Vaughn, 2011) has been conducted on the effectiveness of RR throughout the years. Yet, school districts often

wonder, “Will we realize the same positive results in our district?” With that question in mind, Quay, Steele, Johnson and Hortman (2001) conducted multivariate and univariate analyses of student progress in RR the initial year of introduction in their school district. Their purpose was to determine the program’s overall effectiveness including its merits and drawbacks. The participants of their research are first- and second-round RR students in their districts, as well as their teachers-in-training. The overriding purpose was to determine if the RR students in a newly implemented program differed in reading achievement from their classroom counterparts who did not participate in RR. Each of the 34 elementary schools randomly selected one classroom from which all RR students would be selected and randomly selected one classroom as the comparison group. Data collected on all students included the full Observation Survey of Early Literacy Achievement, the Iowa Test of Basic Skills and the Gates-MacGinitie Reading Test. Fall scores were similar on all tests but spring scores indicated that the RR group had higher scores than the comparison group on all tests. The Iowa Basic Skills Test results are $p<.05$ on reading comprehension, word analysis, reading total and language total; and $p>.05$ on listening and vocabulary. The Gates-MacGinitie results are $p<.001$ on initial consonants, final consonants, vowels, and context in sentence. The findings indicated that RR participants significantly exceeded the comparison children on all post-test measures (p. 18). The researchers also noted that enhanced reading performance increased overall academic achievement as well as the child’s personal and social development (Quay et al., 2001).

Similar to Quay et al. (2001), Pinnell, Lyons, DeFord, Bryk and Seltzer (1994) conducted a split plots design research study that was replicated over a series of blocks (i.e., school districts). The study looked at the effectiveness of RR as compared to the overall cost of the program. Pinnell et al. (1994) compared Reading Recovery to other relevant literacy programs at the time of their study. They studied the literacy instructional models for high-risk first grade students. Within each school a pool of the ten lowest-scoring students were identified, and then four of the students were randomly assigned to a treatment group. In essence, each school became a small-randomized trial for one treatment. Pinnell et al. asked if a general one-on-one reading tutorial is enough for at-risk students or if the more intensive and costly Reading Recovery model is needed. A total of 403 students (238 male and 165 female) from Chapter 1 (now Title I) schools located in rural, suburban and urban settings participated in the study. The students were randomly assigned to one of five groups: Reading Recovery, Reading Success (one-on-one intervention taught by teachers who were briefly trained in RR strategies), Direct Instruction Skills Plan (individual intervention utilizing direct instruction theories, materials and practices), a Reading and Writing Group (small group tutorial taught by a trained RR teacher), and a comparison group (existing Chapter 1 services). All students were administered various assessments in October 1989, February, May, and October 1990. The study found that RR participants performed significantly better on hearing and recording sounds in words (dictation), text level reading, Gates-MacGinitie, and Woodcock Reading Mastery Test than any of the other intervention groups or the comparison group (CG) at every stage of assessment. After seventy days of instruction, Reading

Recovery students were 5 book levels higher than children who received regular remedial reading lessons. Therefore, the results indicated that a one-on-one tutorial approach is beneficial and that the RR approach will yield the highest gains. It appeared that RR's instructional model as well as its extensive teacher interactions, training, and educational requirements significantly and positively impacted students' success (Pinnell, 1994).

Askew and Frasier (1994) conducted a longitudinal study that compared former discontinued RR students to their peers when all students were in second grade. Throughout nine Texas school districts, 54 former RR students were selected for the control group and 53 non-RR peers were randomly selected as the study's random group. Classroom teachers evaluated the students on various literacy tasks and their respective classroom rankings. Askew and Frasier concluded that discontinued RR students sustained their literacy gains throughout second grade.

Gapp (2006) studied the end of RR treatment decisions (successfully discontinued vs. recommended action) and how it impacted the later achievement of students when they reached third, fourth, and fifth grades. Data was collected from 176 former RR students in six South Dakota school districts between the 2000-01 and 2002-03 school years. The research design was a causal-comparative design because the subjects had previously received treatment and were not randomly assigned to the study. All former, full round, RR students who were currently in third to fifth grades and who were attending an evaluated school district were included in the study. The findings indicated that the treatment decision significantly predicted reading

achievement for students in third and fourth grades but not for fifth grade. Gapp concluded that the end of RR placement is a good predictor of later reading achievement in third to fifth grades.

Leveled Literacy Intervention

Leveled Literacy Intervention (LLI) by Irene C. Fountas and Gay Su Pinnell is an intensive, short-term literacy intervention designed for children in Grades K-3 (Harrison et al., 2008). Due to its recent release into the world of early literacy interventions, research on LLI is far less exhaustive than Reading Recovery research. However, the initial reports suggest that LLI is consistently effective at raising the literacy text levels of at-risk students in grades K-2 (Harvey, 2001; Ransford-Kaldon, 2010). Dr. Ransford-Kaldon (2010) specifically highlighted the effectiveness of LLI for English-language learners, those who are economically disadvantaged, and those who qualify for special education services.

The Work of Fountas and Pinnell

Gay Su Pinnell and Irene C. Fountas (1998) stated that they have lived their entire adult lives as teachers of literacy. In their view, language and literacy are the essential societal tools that children must learn and use. First and foremost, it is their belief that children should enjoy literacy, and that literacy should enhance the child's quality of life (Pinnell & Fountas, 1998). Writing is an essential way of communicating, expressing thoughts, and organizing the details and events of life (Martin, Segraves, Thacker & Young, 2005). Fountas and Pinnell claimed that through the ability to effectively read and write, a child will have a greater economic

reality and more personal freedoms (Pinnell & Fountas, 1998). The Global Literacy Campaign (2014) forecasted that by 2018, 63% of all American jobs will require at least some post-secondary education. The Global Literacy Campaign also shared that 43% of adults living in poverty are at the lowest level of literacy, whereas only 4% of adults with strong literacy skills live in poverty (http://www.scholastic.com, 2014).

Guided Reading to Leveled Literacy Intervention

In 2009, Pinnell and Fountas released *When Readers Struggle: Teaching that Works* as the pedagogical companion for LLI. "If we are serious about teaching every child (to read), then we need to take the position that no one program or set of policies will result in proficient reading for all children" (p. xi). Fountas and Pinnell stated that the three main factors preventing real success in schools are: few programs have been applied with integrity and quality, few programs have been sustained long enough to fulfill the promise, and attempts have been isolated efforts rather than coordinated and comprehensive systems. Juel (1998) conducted a longitudinal study of 54 children from Austin, Texas. She found that if a child is a poor reader in the first-grade, there is a 90% chance that the child will also be a poor reader at the end of fourth grade.

Fountas and Pinnell (2009) believed that American schools need a many-layered and coordinated approach that offers high-quality instruction in the variety of forms necessary to serve each child at the level needed. Their goal is achievable for most children. Thus, they created the Leveled Literacy Intervention system that includes teacher manuals, high-quality leveled books, parent correspondence,

learning activities, word works, literacy games, and ready-made explicit lesson plans (Fountas & Pinnell, 2009).

The guided reading teaching approach is designed to help individual students learn how to process a variety of increasingly challenging texts with understanding and fluency (Richardson, 2009). The classroom teacher teaches guided reading, and it is designed to be the child's first, best instruction (District, 2013). Guided reading occurs in a small-group setting because this allows for interactions among readers that will benefit the individual students and the entire small group. The teacher selects and introduces the text, occasionally supports the students while reading the text, engages the readers in a discussion relevant to the reading, and makes teaching points immediately after the reading. Some lessons will include writing about the reading (Fountas & Pinnell, 1996, 2001; Richardson, 2009).

LLI does not negate the importance of guided reading for all students. Rather, LLI is designed to meet specific deficits of the most struggling students. Guided Reading and LLI are instructionally similar in the following ways: they utilize text that is carefully selected, predictable and "just right;" they support comprehension through book introductions, discussions, and specific teaching; fluency is specifically taught and prompted; writing about reading occurs every other day; phonics/word study instruction is included; vocabulary development is implemented; and student motivation is fostered. Guided reading and LLI differ in the following ways: LLI is supplemental instruction for students who are falling behind their peers and guided reading is a student's first, best instruction; LLI is designed to last for 10-20+ weeks,

guided reading is an on-going process; and in LLI the materials are predesigned and formatted specifically for LLI whereas guided reading the materials are selected by the teacher from the school's library of leveled books (Fountas & Pinnell, 2013; Richardson, 2009).

An Evaluation of Leveled Literacy Intervention and At-Risk Learners

Fountas' and Pinnell's (2009) Leveled Literacy Intervention program received permission in January 2006 from the Center for Reading Recovery and Literacy Collaborative (CRR) to conduct training for their new LLI program in a large, urban American school district. The staff development periods were: February 27-March 1, March 14-16, and April 24-25, 2006. Trainings were not able to begin until the semester was underway—thereby reducing the instructional period to only 14 weeks. Participants in the training were given five qualitative surveys, and they were scored on a Likert 5-point scale. In the area of professional development, as it directly related to LLI, the researchers found that a majority (78.9%) of participants reported having participated in more than 20 hours of professional development in literacy the previous year. Almost half of the group (47.4%) had more than eight years experience working with struggling readers; however, the amount of time spent with struggling readers in a small group setting varied (Harrison et al., 2008). Even though the LLI program does not require on-going professional development and training for teachers, it is highly encouraged; and many districts provide this opportunity for their teaching staff (Harrison et al., 2008).

In 2009-10, Ransford-Kaldon, Flynt, Ross and the Society for Research on Educational Effectiveness (2011) conducted an empirical study on the efficacy of LLI. While it is important to note that the study was paid for by Heinemann Publishing, the publishing company of LLI, and therefore does not meet the threshold for "scientifically, researched based" status, this research went to great lengths to state unbiased results. The Control Group (CG) was comprised of at-risk students who were below grade level in the area of literacy. After 38 days of LLI instruction, kindergartners who received LLI achieved a mean gain of 1.56 benchmark levels as compared to 0.78 benchmark levels for kindergartners who did not receive the LLI intervention. Also, kindergartners in LLI started, on average, below grade level in benchmark testing (i.e., pre-A = 0) but finished at a level between A (DRA 1) and B (DRA 2), whereas their counterparts in the control group started near pre-A (DRA A) and finished around Level A. Thus, kindergartners in LLI finished the school year close to grade level in reading (aggregate $p < .001$).

Murray, Munger, and Hiebert (2014) conducted a comparative study between LLI and Scott Foresman's My Sidewalks (MS). Currently, this is the only published study that compares LLI to another early literacy intervention program. Their first research question asked: How do LLI and MS compare at the word-level, the text-level, and the program-level? The second research question asked: How do some of these features correspond to programs of previous decades?

For word-level features, all words from the student texts were entered into a word processing-system and then they were grouped into ten levels for each program.

Thus, there were 10 word lists for LLI and 10 word lists for MS. From these lists, the researchers established: word repetition, number of high frequency words, multi-syllable words frequency, and the percentage of phonetically regular words. The results show that LLI and MS texts are similar (a difference of <.05) at each level (LLI=30%, MS=28%). In terms of variability, MS (19% to 39%, depending on level), has more variability across levels when compared to LLI (25% to 34%, depending on level). For the average percentage of high frequency words, LLI scored 66% whereas MS scored 59%. At each level, LLI texts have a high frequency word range of 64% to 70%. The percentage of phonetically regular words in LLI text ranged from 25% to 51%, depending on the text level, whereas the range for MS was 51% to 71%. Finally, LLI had a multi-syllable word average, across all text levels, of 23%, whereas MS averaged 11%.

For text-level (book level) features, percentages were established for singletons and type-token ratios. The percentage of singletons was divided by the total of unique words and multiplied by 100. Dividing unique words by the total number of words in each level and multiplying by 100 calculated the percentages of type-token words. The results show that the overall percentage for singletons contained at each level for LLI are 45% and for MS are 41%. For type-token ratios, the text-level features for LLI are 20% and for MS are 26%. The relative program stability across levels for LLI is 17% to 26% and for MS is 24% to 32%.

For program-level features, phonics and word work lessons from LLI and MS teacher guides were reviewed, and corresponding phonetic elements to the student

lessons were inventoried. For both LLI and MS, cumulative lists of phonics elements were created so that words in texts could be matched to them (e.g., short "a", silent "e" patterns). Then, two independent raters examined every word in each text and marked whether the words are decodable based on the phonics element(s) taught in that lesson or in previous lessons. Calculating the lesson-to-text-match was a two-step process. First, researchers divided the number of decodable words by the total words in each text. Then, the average of all lesson-to-text matches within a level was calculated. The results show that the program averages for the lesson-to-text-match analysis for LLI was 31% and for MS was 68%. Finally, the percentages of phonics lessons aligned to the text for LLI was M = 31% and for MS was M = 68%. This resulted in a standard deviation for LLI of 9.93% and a standard deviation for MS of 2.52%.

Murray, Munger, and Hiebert (2014) concluded that LLI appears to align with the meaning-emphasis (whole language) philosophy. The program emphasis of meaning, semantic cues, natural language patterns, predictable syntactic patterns, and word repetition is supported by the program's lessons and the provided student texts.

Research attempted to include studies on the continued trajectories of former LLI students, but, as of publication, none existed.

Chapter Conclusion

Historically, the American education system has encountered many changes. It has transitioned through basal readers, to a whole language approach, to balanced literacy. Each stage was unique and allowed educators to capitalize on specific

targets in the early literacy journey. Reading Recovery and Leveled Literacy Intervention are two early literacy interventions that strive to meet the challenging needs of struggling readers.

Administrators are grappling with the decision on which early literacy intervention or combination of interventions will best support their struggling young readers. Reading Recovery is the most widely researched and most widely used international early reading intervention, and many studies have been conducted on its effectiveness (Slavin et al., 2009). However, research on Leveled Literacy Intervention is limited in quantity and scope. This study is unique in that it compared the one-on-one tutoring approach of Reading Recovery with the small group approach of Leveled Literacy Intervention.

Reading Recovery and Leveled Literacy Intervention are the early literacy interventions that were evaluated. The two programs are based on Marie Clay's whole-language approach to literacy intervention, but each program has a unique methodology. Table 1 below demonstrates the similarities and differences between Reading Recovery and Leveled Literacy Intervention.

Table 1

Similarities and Differences between RR and LLI

Similarities	Differences
Early literacy intervention programs Whole Language Approach with phonics instruction Lesson Rounds are about 14-20 weeks; 5 days a week; 30 minutes per day Both programs include: phonics/word work, text level reading (familiar and new books), writing about text, and homework components Both programs value parent involvement. RR students bring home a daily "reading bag" with a book to read and a cut-up sentence to assemble. LLI students also bring home a "reading bag" with a book to read and possibly a homework sheet. At the beginning of each text level, a standard letter is sent home to parents. (Clay, 2005a; Heinemann, 2014)	RR is a one-on-one tutoring program whereas LLI is a small group intervention program. RR is a first grade only intervention whereas LLI is designed for grades K-3 RR students are given "An Observation Survey" to determine program readiness and if the student discontinues (graduates). For purposes of this study, students are also given a DRA assessment, before and after program completion, to determine program readiness and end-of-year grade level status and growth. LLI students are given a DRA assessment to determine program eligibility and determine end-of-year grade level status and growth. RR requires on-going staff development and training whereas LLI highly recommends it but is not a requirement. (Clay, 2005a; Heinemann, 2014)

Chapter III: Methodology

Introduction

Every school across the United States has readers who struggle in their quest to gain early literacy skills. Every district also has administrators asking how they can best meet the needs of these learners in a fiscally responsible manner. This study evaluated the effectiveness of two early literacy programs—Reading Recovery and Leveled Literacy Intervention-—to determine if they are able to successfully support students in their quests to reach end-of-year-first-grade benchmarks. Next, the study analyzed whether or not the students who reached the end-of-first-grade benchmark were able to maintain their growth trajectories through the conclusion of their second-grade year. Finally, this study compared the achievement effectiveness—in terms of text level reading growth—of Reading Recovery and Leveled Literacy Intervention, when controlled for initial DRA text level, gender, ethnicity and free or reduced lunch rate.

Philosophy and Justification

This study is a causal comparative quantitative research study utilizing secondary data. Currently, school district administrators are faced with the knowledge that 37% of American fourth graders read at or below a basic reading

level for their grade (NAEP, 2012). If current trends continue, each non-proficient fourth grade reader is four times more likely than proficient fourth-grade readers to drop out of high school (NAEP, 2012). Annually, the American economy loses more than $26 billion dollars in federal and state income tax from the 23 million high school dropouts aged 18-67 (The Campaign for Educational Equity, 2005). The connection between non-proficient primary readers and the future quality of life decisions for these students is a well-documented reality. Thus, district administrators must be equipped with research that demonstrates which early literacy intervention programs are effective and affordable.

Furthermore, there is a significant amount of research on Reading Recovery as an isolated program. However, as of publication, research has not been conducted that compares RR to the Leveled Literacy Intervention program. This is significant as there is a gap in the research comparing the outcomes of these two interventions. Since LLI is a new addition to the field, this research study addresses an important concern in the field of early literacy education.

This is also significant because when the creator of Reading Recovery, Marie Clay, first brought her program to America, she mentored Irene Fountas and Gay Su Pinnell of The Ohio State University. Through this experience, Marie Clay taught them her system and approach to first-grade reading interventions. Decades later, Fountas and Pinnell (2009) created the Leveled Literacy Intervention program which, in many ways, transitions the Reading Recovery model into a small group intervention model (Heinemann, 2013; RRCNA, 2013).

Reading Recovery (RR) and Leveled Literacy Intervention (LLI) are both early literacy programs that follow the whole language premise. Both programs incorporate reading of independent and instructional texts, writing about reading, phonics, and comprehension. Both programs are taught for 30 minutes/day for approximately 20 weeks. Both programs emphasize teacher training and development. However, Reading Recovery requires high quality, on-going staff development, and LLI simply recommends it. Reading Recovery is a one-on-one program. LLI is a small group intervention. Ideally, LLI groups are comprised of 3 students at the same instructional text level with similar strengths and struggles (Heinemann, 2013; Ransford-Kaldon, 2009; RRCNA, 2013).

During the course of this study, the following research questions guided the investigation:

1. For non-special education, tier 3 first-grade students, who participated in Reading Recovery, or Leveled Literacy Intervention, or a combination of both interventions: which of these three interventions have brought students to the end-of-first-grade Development Reading Assessment (DRA) benchmark when controlled for initial DRA level, gender, ethnicity, and free or reduced lunch rate?
2. For non-special education, tier 3 first-grade students who achieved grade level status during their first-grade year, after participating in Reading Recovery, Leveled Literacy Intervention, or a combination of both programs: what percentage of students continued to reach the end-of-second-grade Development Reading Assessment (DRA) benchmark when

controlled for initial DRA level, gender, ethnicity, and free or reduced lunch rate?

3. For non-special education, tier 3 first-grade students, is there a growth difference, as measured by a gain in DRA reading levels, in reading achievement based on their participation in Reading Recovery, Leveled Literacy Intervention, or a combination of both programs; when controlled for initial DRA level, gender, ethnicity, and free or reduced lunch rate?

Theoretical Framework

This is a causal-comparative, also commonly known as an *ex post facto*, quantitative research study (Patten, 2012) with the goal of identifying a cause and effect relationship between the students and the early literacy intervention in which the student participated (Kravitz, 2014). This research study is non-experimental in nature and therefore the researcher describes observations but does not give treatments (Patten, 2012). The main characteristics include: (1) a current condition is observed and described and (2) the study utilizes secondary data that was previously collected for the purpose of trying to determine what factor(s) caused the outcomes (Patten, 2012).

Reading Recovery and Leveled Literacy Intervention are grounded in Marie Clay's (1979, 1981, 1985, 1987, 2001, 2005, 2007) exhaustive work in early literacy. Both interventions are grounded in an internationally recognized whole language approach to early literacy (RRCNA, 2013). Both programs incorporate reading of independent and instructional texts, writing about reading, phonics, and

comprehension. Both programs are taught for 30 minutes/day for approximately 20 weeks. Both programs emphasize teacher training and development (Heinemann, 2013; Ransford-Kaldon, 2009; RRCNA, 2013).

This study will address the gap in research by comparing Reading Recovery to Leveled Literacy Intervention. It will provide stakeholders with relevant data about the achievement growth and sustainability—in terms of text level reading—for RR, LLI and a combination of both programs. It is hoped that this comparison will impact future early literacy decisions made by key educational stakeholders.

Variables

There is one independent variable: reading intervention status. As displayed in Table 2, this variable has three groups: (1) RR only; (2) LLI only; and (3) both RR and LLI. Reading Recovery and Leveled Literacy Intervention provide students with a first-grade literacy intervention based upon the same whole-language philosophy. All students who participate in one of the first three groups will receive explicit instruction in phonics, letter/word work, exposure to instructional and independent level texts, and consistent writing instruction.

Table 2

Research Questions, Dependent Variables, and Independent Variables

Research Question	*Reading Level*	*Measure*	*IG*
RQ 1	For non-special education, tier 3 first-grade students, who participated in Reading Recovery, or Leveled Literacy Intervention, or a combination of both interventions: which of these three interventions have brought students to the end-of-first-grade Development Reading Assessment (DRA) benchmark when controlled for initial DRA level, gender, ethnicity, and free or reduced lunch rate?	DRA	RR, LLI, Both
RQ 2	For non-special education, tier 3 first-grade students who achieved grade level status during their first-grade year, after participating in Reading Recovery, Leveled Literacy Intervention, or a combination of both programs: what percentage of students continued to reach the end-of-second-grade Development Reading Assessment (DRA) benchmark when controlled for initial DRA level, gender, ethnicity, and free or reduced lunch rate?	DRA	RR, LLI, Both
RQ 3	For non-special education, tier 3 first-grade students, is there a growth difference, as measured by a gain in DRA reading levels, in reading achievement based on their participation in Reading Recovery, Leveled Literacy Intervention, or a combination of both programs; when controlled for initial DRA level, gender, ethnicity, and free or reduced lunch rate?	DRA	RR, LLI, Both

Note. IG = Intervention Group

Hypothesis

$H1_0$: There is no difference between Reading Recovery, Leveled Literacy Intervention, or the combination of both interventions in terms of meeting the end-of-first-grade benchmark and the initial DRA level, gender, ethnicity, and free or reduced lunch rate will not affect which students met the end-of-first-grade benchmark.

$H1_1$: The Reading Recovery intervention will have the highest percentage of students meeting the end-of-first-grade benchmark and the initial DRA level, gender, ethnicity, and free or reduced lunch rate will affect which students met the end-of-first-grade benchmark.

$H2_0$: There is no difference in the percentage of students who will continue to meet the end-of-second-grade benchmark, regardless of their participation in Reading Recovery, Leveled Literacy Intervention, or a combination of both interventions and the initial DRA level, gender, ethnicity, and free or reduced lunch rate will be not affect which students met the end-of-second-grade benchmark.

$H2_1$: The second-grade students, who achieved grade level status via the first grade literacy intervention Reading Recovery, will have the highest percentage of students who met the end-of-second-grade benchmark and the initial DRA level, gender, ethnicity, and free or reduced lunch rate will affect which students met the end-of-first-grade benchmark.

$H3_0$: No difference exists in reading achievement among students participating in Reading Recovery, Leveled Literacy Intervention, or a combination of both, when controlled for fall first-grade DRA text level, gender, ethnicity, and free or reduced lunch rate.

$H3_1$: Differences exist in reading achievement among students participating in Reading Recovery, Leveled Literacy Intervention, or a combination of both, when controlled for fall first-grade DRA text level, gender, ethnicity, and free or reduced lunch rate.

Research Design Strategy

The design of this research project is a causal comparative study utilizing secondary data. The core focus is an examination of three first-grade literacy intervention programs and their role in helping severely at-risk students reach and maintain grade level status through the end-of-second-grade.

This research project will utilize secondary reading data from the 2010-11 (kindergarten), 2011-12 (first-grade), and 2012-13 (second grade) school years. The study examines and compares the reading achievement of children who participated in Reading Recovery, Leveled Literacy Intervention, and a combination of both RR and LLI. Analysis of covariance tested for achievement differences among the intervention groups when controlled for initial DRA level, gender, ethnicity, and free or reduced lunch rate.

Reading Recovery and/or Leveled Literacy Intervention teacher(s) assigned the students into one of the intervention groups. Their placement into the intervention

group depended upon many qualifying factors including: end-of-kindergarten DRA data in combination with first-grade fall DRA data, teacher recommendations, scores on RR's "An Observation Survey of Early Literacy Achievement," and potential directives from school district personnel. Reading Recovery teachers will select their students first, followed by the Supplemental Programs (Title I) teachers for the LLI intervention. The selection for participation in LLI will include: DRA scores, group dynamics, and building schedules. In January, first-round RR students may be assigned to LLI as a means of scaffolding the participants' supplemental support. Additionally, a first round LLI participant might be selected as a second-round (January) RR participant. Since RR teachers only see four students per round, the impact of the RR teachers' ability to select students first will have a negligible impact on the research study.

All participants in the study began their first-grade year as non-special education, tier 3 (independent DRA reading levels A-3) students to account for the various reading levels at which students naturally begin first grade. Since all participants are starting as tier 3 students and have a history of early failure, the literacy interventions are the new dynamic to their instruction and therefore will play the greatest role in the participants' success. In the event that the interventions are unsuccessful, the teachers and administrators will be led to consider alternative early literacy interventions and/or special education services.

Measures

Reading achievement levels are based on the Developmental Reading Assessment (DRA), which is a set of individually administered criterion-referenced

reading assessments for students in kindergarten through Grade Eight. The DRA is modeled after an informal reading inventory and is designed to be administered, scored, and interpreted by classroom or academic support teachers. The measure given to participants in the study is the Developmental Reading Assessment, Kindergarten through Grade 3, First Edition (DRA, K–3, Beavers, 1999). The creation of the program relied heavily on research literature in the areas of reading development and instruction. The intention of the DRA is to assess a student's independent reading level and inform the teacher of the child's instructional level. This is defined as a test on which the student meets specific criteria in terms of accuracy, fluency, and comprehension. Additional purposes include identifying the student's reading strengths and weaknesses, planning instruction, and providing information to stakeholders regarding reading achievement levels.

The reliability of the DRA Assessment has been thoroughly scrutinized. The inter-rater reliability, based on Rasch analysis for the five scale rating items (accuracy, comprehension, reading stage, phrasing, and reading rate) was .80 for the first two raters (Rathvon, 2006; Williams, 1999). Williams (1999) utilized a Rasch 4 facet rating scale and Cronbach's alpha was utilized to determine the internal consistency of the items and text. Williams (1999) found the inter-rater reliability to be 0.74 across students, items, and text levels. This is an acceptable rate for screening purposes but Rathvon (2006) argued that it falls below criterion levels for instruments that are designed for individual diagnostic and programming purposes. Williams (1999) disagreed and stated that the internal consistency has been found to be "quite strong" for the five rating scale items. This includes the item separation

reliability (Crobach's alpha = 0.98) across all three raters, as well as for the DRA text separation reliability in the DRA assessment texts (Crobach's alpha = 0.97). The DRA assessment has been found to be statistically robust in the following areas: internal consistency reliability, passage equivalency, test-retest reliability, and inter-rater and expert rater reliabilities (Beavers, 1999; Paris, Pearson, Carpenter, Siebenthal & Laier, 2002; Paris & Carpenter, 2003).

Williams (1999) analyzed the DRA's construct validity. She stated that the DRA instructional reading levels demonstrated a strong correlation with the Iowa Test Basic Skills' Total Reading subscale for one large urban/suburban school district. This evidence continues to strengthen and support the viewpoint that the DRA assessment validly measures a child's ability to decode, comprehend, and understand the passage the child just read (Beaver, 2003; Williams, 1999).

Weber (2000) examined the DRA by watching the test-retest reliability coefficient, over a 3-week interval, of an independent reading level sample. The participants included 306 students in Grades 1 through 3 (ns = 100 to 104). The results were high for all three grades (rs = .92 to .99), but it is unclear if the students were tested twice on the same text or on alternative texts of the same level (Rathvon, 2006; Weber, 2000).

The DRA assessment correlates with the industry standard Lexile measure. A 1998 study was conducted with a sample of students in second and third grades (n = 259), who were at a DRA independent reading level 9 to level 30. The overall correlation between the Lexile measure and the DRA level was .69 (Rathvon, 2006).

More importantly, the DRA assessment has undergone rigorous testing (e.g., criterion-related validity, construct validity, and content validity) to assure the validity of the accuracy, fluency, and comprehension measures (Beavers, 1999; Paris et al., 2002; Paris & Carpenter, 2003).

The Vermont DRA Validity and Reliability Report provided further support for the validity and reliability of the DRA (Beaver, 2003; Williams, 1999). Biggam and Grainger (1998), as cited in Williams (2009) concluded,

> A new variation on the notion of content validity is authenticity. Authenticity is analogous to curricular validity in the sense that with both concepts, a test is compared to some external standard of appropriateness…With authenticity, the external standards are various types of literacy tasks that people engage in across a variety of literacy environments…The key question is, 'Does this test reflect the ways in which we can expect students to use literacy for communication and learning purposes?'" (p. 6).

Through a student's response to retelling of the real text, the DRA has been found to be an authentic performance assessment.

Sampling Design

Setting

The school district is located in the Midwestern section of the United States in a large suburban setting. It is one of the largest school districts in the state, and

during the 2012-13 school year nearly 38,000 students were educated in Grades K-12.

The school district is comprised of 24 elementary schools, six middle schools, five high schools and two alternative programs. Of the 24 elementary schools, 10 schools are Schoolwide Title I schools with 40% or more of the school's population qualifying for free or reduced lunch (MN Department of Education, 2014), four schools are Targeted Assistance Title I schools with a high percentage of students from low-income families (U.S. Department of Education, 2014), and 10 schools do not receive federal Title I funding. Every school in the district receives state Compensatory Education funds that are allocated through the district's Supplemental Programs department.

The school district under study is required to provide their state's Department of Education with annual enrollment data that is based on October 1. On October 1, 2013, district-wide 38,449 students were enrolled in Grades Pre-K through 12. Of those students 12,757 (34.81%) qualified for free or reduced lunch rates. The percentage of non-white students was 22.28% and was broken down as follows: Native American (1.38%), Asian (6.59%), Hispanic (4.08%) and Black (10.17%).

District Under Study

Reading Recovery is an expensive program, and the cost is affecting the district under study. Three of the elementary schools chose not to continue the long-established program for the 2013-14 school year but intend to re-establish the program for the 2014-15 school year. The district is continuing to struggle with the direction in which it should go, the extent of the financial resources it should spend on early literacy interventions, and which program or combination of programs will

effectively raise the achievement level of struggling first grade readers. Ultimately, the district administrators, policymakers, and stakeholders will require a clear-cut answer to the critical and timely questions and issues surrounding student growth and achievement in reading.

Sample

The participants in this quantitative study will be first-grade students in a large suburban school district that qualified for a tier 3 literacy intervention outside the realm of special education. In all three intervention types, the initial fall DRA levels of first-grade students may range from a DRA level A – DRA level 3. When the study has been completed, more information on the students' initial DRA levels will be available.

A complete census of the district's sub-population that is comprised of tier 3 non-special education first-grade students will be utilized. For the qualifying students who achieved the grade level benchmark at the conclusion of first-grade, the study followed them through the conclusion of their second-grade year. This study collected data from the 2010-11 (kindergarten), 2011-12 (first-grade), and 2012-13 (second grade) school years. Kindergarten data was collected because RR teachers look at spring kindergarten DRA levels when they make their first round selection decisions. For the purposes of this study, a students' initial DRA levels was based on their spring kindergarten DRA scores. Consideration was given to using two or three years of data but this study was limited to the above mentioned years because the district under study modified its student selection process and increased the amount of teacher training that was provided. Beyond the changes for 2013-14, the study could

not collect data before 2010 because LLI was introduced into the district under study in the spring of 2010 to prepare for a full program rollout in the fall of 2010 (district representative, 2013).

It is important to note that occasionally students transfer out of the school during an intervention cycle. For the purposes of this study, only students who completed a full, 18-20 week round of Reading Recovery, Leveled Literacy Intervention, or both Reading Recovery and Leveled Literacy Intervention were included in this study. When following the progression of first-grade students who met the end-of-first-grade benchmark into their second-grade year, only those students with complete second-grade reading data were included in the study.

The school district under study is required to provide the state Department of Education with annual enrollment data that is based on October 1. On October 1, 2013, district-wide more than 38,000 students were enrolled in Grades Pre-K through 12. This large school district has high economic diversity with one-third of the students qualifying for free or reduced lunch. The district has limited cultural diversity with one-fifth of the population self-categorizing as non-white.

Of the students who participated (N = 631), 250 (39.6%) were in RR only, 246 (38.9%) were in LLI only, and 135 (21.4%) were in both RR and LLI.

Table 3

Sample Demographics

Intervention Type	*Sample Size*	*Kdg DRA*	*Ethnicity*	*Poverty*	*Gender*
Reading Recovery	250	DRA A: 3 DRA 1: 29 DRA 2: 65 DRA 3: 43 DRA 4+:35	White: 158 Black: 29 Other: 63	FRP: 135 Full Rate: 115	Male: 120 Female: 130
Leveled Literacy Intervention	246	DRA A: 5 DRA 1: 19 DRA 2: 26 DRA 3: 64 DRA 4+:103	White: 180 Black: 31 Other: 35	FRP: 121 Full Rate: 125	Male: 128 Female: 118
Both RR and LLI	135	DRA A: 5 DRA 1: 12 DRA 2: 32 DRA 3: 43 DRA 4+:25	White: 88 Black: 23 Other: 24	FRP: 73 Full Rate: 62	Male: 67 Female: 68

For Research Question 2, a subset of the original sample, those from each of the treatment groups who achieved grade level status in the first phase of the study will be followed until the conclusion of their second-grade year to determine what percentage of students sustained their reading achievement levels and which demographic factors—initial DRA level, gender, ethnicity, and free or reduced lunch rate—affected which students met the benchmark. Overall, there will be 240 (38%) students from the intervention groups in phase one of the study that achieved their end-of-first-grade benchmark. Of those, 115 (47.9%) were in RR only, 85 (35.4%) were in LLI only, and 40 (16.7%) were in RR and LLI.

For Research Question 3, the study compared Reading Recovery and Leveled Literacy Intervention. The comparison looked at student text level growth (when controlled for initial DRA level, gender, ethnicity, and free or reduced lunch rate) to determine the interventions' effectiveness.

Data Collection Procedures

The school district under study utilized the Developmental Reading Assessment (DRA) measures to determine the reading ability of all primary students. The DRA assessment is a nationwide assessment tool. However, the DRA program does not set the assignment of grade-level benchmarks, allowing individual districts to set them.

The district under study has established a DRA End-of-Year grade level benchmark rubric for grades K-2. Table 4 demonstrates, by grade level, how the district measures achievement. This achievement information is entered into the district's data management system. It is then shared with parents at conferences and printed on the students' report cards.

Table 4

End-of-Year Grade Level Benchmarks (DRA)

Grade Level	*Above Grade Level*	*Grade Level*	*Approaching Grade Level*	*Below Grade Level*	*Significantly Below Grade Level*
K Spring	6+	4	3	2	1-A/.5
1st Fall	10+	8	6	4	3-A/.5
1st Spring	20+	18	16	14	12-A/.5
2nd Spring	34+	30	28	24	20-A/.5

In the spring of each year, all primary students are given the DRA assessment. The classroom teacher primarily gives the assessment but instructional coaches, reading specialists, and supplemental programs staff may assist with the DRA assessment process and testing for logistical purposes. Once the assessments are given, the classroom teacher has until a pre-determined date in May to enter the data into the district's data management system.

For the purposes of this study, the data was pulled from the district's data management system and exported into both an Excel and Statistical Package for the Social Sciences (SPSS) spreadsheet. The end-of-year grade-level benchmarks, for the purposes of this research study, will align with the district under study. Therefore, grade level achievement will be a DRA 18 in first grade and a DRA 30 in second grade. The data was evaluated and analyzed to determine which early literacy interventions—Reading Recovery, Leveled Literacy Intervention, and/or a

combination of both Reading Recovery and Leveled Literacy Intervention—bring at-risk readers to grade level status and help them maintain that status through their second grade year.

District Data Collection Policies

The school district under study has an official process to ensure that student confidentiality is protected throughout the research process; and all research must align with the district's current initiatives and benefit student achievement in the district. The district required an official application outlining the purpose and scope of the project, the intent, methods, and alignment with district initiatives. Once the application was received, a small committee consisting of an Associate Superintendent, representatives from the Curriculum, Instruction and Assessment department, and the Research, Evaluation and Testing department, reviewed the proposed study. All researchers must sign a confidentiality waiver. The application process requested access to kindergarten-, first-, and second-grade reading data for the 2010-11, 2011-12 and 2012-13 school years.

Data Analysis

Descriptive statistics, regarding initial DRA, gender, ethnicity, and socio-economic status were provided for the total sample and for each of the intervention groups using frequency distributions.

To answer Research Question #1, DRA scores at the end of the participants' kindergarten year were compared to their scores at the end of their first-grade year. A cross tabulation analysis was conducted to determine which of these three

interventions have brought students to the end-of-first-grade Development Reading Assessment (DRA) benchmark when controlled for initial DRA level, gender, ethnicity, and free or reduced lunch rate. The percentages were broken down by intervention type: Reading Recovery only, Leveled Literacy Intervention only, and both Reading Recovery and Leveled Literacy Intervention. Once the percentages were determined, a chi square analysis and a descriptive statistics analysis were conducted to determine the mean DRA. Standard deviations were examined to determine which intervention(s) bring students to grade level status at the conclusion of first grade. Finally, an ANCOVA analysis of variance will be conducted to determine the impact of the students' initial DRA level, gender, ethnicity, and free or reduced lunch rate on their ability to meet the end-of-first-grade DRA level 18 benchmark.

To answer Research Question #2, for those students who met the end-of-first-grade benchmark, DRA scores at the end of the participants' first-grade year were compared to their scores at the end of their second-grade year. A cross tabulation analysis was conducted to determine what percentage of students continued to reach the end-of-second-grade Development Reading Assessment (DRA) benchmark when controlled for initial DRA level, gender, ethnicity, and free or reduced lunch rate. The cross tabulation analysis broke the data down and provided achievement percentages of those who participated in Reading Recovery only, Leveled Literacy Intervention only, and both Reading Recovery and Leveled Literacy Intervention. A chi square analysis and a descriptive statistics analysis determined the mean DRA. Standard deviations were conducted to determine which intervention(s) provided a

strong foundation that allowed students to continue to meet grade level status at the conclusion of second grade. Finally, an ANCOVA analysis of variance was conducted to determine if the covariates initial DRA level, gender, ethnicity, and free or reduced lunch rate impact the students' abilities to maintain their grade level status through the conclusion of second grade.

To answer Research Question #3, a regression statistical analysis, with controls for learner differences such as initial DRA levels (A-3), gender, ethnicity, and socio-economic status were run to determine if there was a growth difference in reading achievement based on the early intervention program a child participated in. To determine the difference score, the regression analysis subtracted the students' grade one fall DRA level from their grade two spring DRA level (Grade 2 spring DRA level – Grade 1 fall DRA level = difference score). The "constant" group for the difference score was white females who received both Reading Recovery and Leveled Literacy Intervention, and had an average end-of-kindergarten DRA level of a DRA 4. Finally, the regression analysis was broken down by covariates—initial DRA level, gender, ethnicity, and free or reduced lunch rate—to determine their impact on the students' reaching achievement growth.

Limitations of Methodology

Results from causal-comparative studies must be interpreted with caution (Area District 267, 2014). A relationship between two variables does not necessarily indicate that a causal connection can be identified or established. Change could originate from the identified variable or from an additional, unaccounted-for variable.

To negate the risk of conducting a causal-comparative research study, the data was controlled for initial DRA level, gender, ethnicity, and free or reduced lunch rate. The sample size (N = 631) was large enough to run analyses of covariance (ANOVA and ANCOVA), which also assisted in the results authentication.

A second limitation of the study is that random student selection was not feasible. Reading Recovery and Leveled Literacy Intervention teachers specifically placed students into intervention groups. Reading Recovery selection is based on reading ability, risk-taking behaviors, classroom teacher support, and parent agreement to complete nightly homework throughout the course of the Reading Recovery round. Leveled Literacy Intervention selection is based on DRA scores, classroom schedule, Supplemental Programs teacher availability, and continuity amongst group members. In January of each year, the process is repeated and a new round of participants is selected for each intervention. It is feasible that a first-grade student who is not selected for the fall round of RR will receive a lesson series of LLI and then be selected for RR in January. It is also feasible that a first grade student is selected for the fall round of RR and is then placed in an LLI group to scaffold the level of support (District Representative, 2013, 2014).

Ethical Considerations

Belmont Report

In 1979, the National Commission for the Protection of Human Subjects in Biomedical and Behavioral Research commissioned the Belmont Report. This report provided an ethical framework for the federal regulations that are designed to protect

human research subjects.

The Belmont Report required that by participating in research, the benefits to the human subjects must have increased and the potential for harm must have been negated. This included providing care for others through: respect of persons, beneficence, and justice. Additionally, the district under study provided clean data to the principal researcher. This data was not traceable to individual participants and did not include personal identifiers. The study was approved by Bethel University's Internal Review Board and was given permission to proceed (Reference #050814-01).

Ethics

The Belmont Report is very specific in regard to ethical research involving human subjects. The data was automatized as a whole, and the student participants were given anonymous, non-traceable numbers to protect their identities and privacy. This study cared for others through: respect of persons, beneficence, and justice. This research study took place in a school setting, utilizing the school district's data to compare the effectiveness of early literacy interventions. Therefore, the study qualifies for exempt status and did not require parental permission waivers for each participant.

Data collection is held with the strictest of confidentiality standards. Initially, teachers employed by the district under study collected the data. The data were shared with the children's parents and teachers working directly with the children in the area of reading. Classroom teachers are responsible for entering the data into the district's confidential database. Key district staff, the child's classroom teacher, and

the Research, Evaluation and Testing (RET) department may access the data that has been entered into the district's database.

Before releasing the study data to the principal researcher, the school district under study removed student identifiers, including names, and the district assigned random numbers to the students. Once the data protection policies were completed, the principal researcher was provided with a data file that contains all of the information required to complete the multiple analyses necessary for the purposes of this study.

The researcher was granted access to the data for study purposes only. Human research subjects will be ethically protected throughout the entire process. The data will be destroyed seven years after the dissertation publication (National Commission for the Protection of Human Subjects in Biomedical and Behavioral Research, 1979).

Chapter Conclusion

In conclusion, this study will look at the first-grade literacy intervention programs Reading Recovery and Leveled Literacy Intervention. The first goal is to determine which interventions support non-special education, tier 3 struggling readers to reach or exceed the grade level benchmark. The second goal applies to participants who achieved grade level after completing RR, LLI or both RR and LLI as first graders. It will determine if they are able to maintain their grade level status through second grade. The third goal is to determine which intervention or interventions—when controlled for initial DRA level, gender, ethnicity, and free or reduced lunch

rate—support the greatest achievement levels through student text level reading growth.

Chapter IV: Results

Introduction

The purpose of this quantitative study is to contribute to the body of knowledge that is needed to provide effective, high-quality early literacy interventions for struggling readers. First, the study's purpose was accomplished by determining whether a significant difference exists between academically at-risk first-grade students receiving the literacy interventions, Reading Recovery, Leveled Literacy Intervention, or a combination of both Reading Recovery and Leveled Literacy Intervention, on reaching the end-of-first-grade literacy benchmark. The end-of-year reading achievement was measured by the Developmental Reading Assessment (DRA). Comparisons were controlled for end-of-kindergarten reading levels, gender, ethnicity, and free or reduced lunch rate. Second, the study tracked students who successfully reached the end-of-first-grade reading benchmark through the conclusion of their second-grade year to analyze the students' abilities to maintain grade level benchmark status at the conclusion of second grade. Third, the research analyzed whether there was a growth difference in reading achievement based on the early literacy intervention in which the student participated. Also, the study deciphered if the covariates—initial DRA level, gender, ethnicity, and free or reduced lunch rate—impact the students' reading achievement.

For the sake of clarity, a basic definition of the statistics involved in this study is provided. "The arithmetic mean is an average calculated by adding the value of the points in a data set and dividing the sum by the number of data points" (http://financial-dictionary.thefreedictionary.com/mean). The purpose of finding the mean DRA level is to compare reading levels amongst the early literacy intervention groups. For this study, the mean DRA is provided by adding together the total number of DRA levels represented and dividing by the number of participants. Often times, the mean DRA provided is not an actual DRA level and therefore the mean was rounded to the nearest DRA level and provided in a separately labeled column. The Standard Deviation (SD) measures the amount of variation from the mean. The purpose of finding the standard deviation is to develop a statistical measure of the mean variance and therefore compare the growth levels via both the mean DRA level and the standard deviations. A low SD indicates that the data points are very close to the mean, whereas a high SD indicates that the data points are spread out across a large range. Standard Deviation variances can be recorded in positive or negative numbers. Hence, the greater the spread, the greater the growth in DRA reading levels. Standard Deviation is also commonly used to measure confidence in statistical conclusions. The Standard Error is determined by calculating the expected standard deviation, if the results from the same data set were calculated multiple times. The standard error depends on three factors: the study population (N), the sample size (n), and the means by which the random sample is chosen. The standard error is important because it is used to calculate confidence intervals and margins of

error. The reported margin of error is commonly double the standard deviation (K. Edwards, personal communication, July 30, 2014).

One-way ANOVA and ANCOVA statistics have additional components. The R^2 is the coefficient of multiple correlations and it demonstrates how well the data fits into a statistical model. Simply, it is a more conservative estimate of the percent of variance. The observed mean results from the use of all data, and an adjusted mean results when the mean has been corrected for imbalances, such as missing data. The Sums of Squares (SS) is an unadjusted measurement of variability. The degrees of freedom (*df)* is the number of data in the collection minus one. When the SS is scaled (normalized) for the degrees of freedom it estimates the variance, or spread of observations. Therefore, the sums of squares do not grow as the data collection grows. Dividing it by the degrees of freedom, or variance, scales the SS. The F test statistic is the ratio of two independent chi-square variables divided by the degrees of freedom. The p-value is the statistical significance testing. When the p-value is $<.05$, it indicates that the observed result is highly unlikely under the null hypothesis, therefore the findings are considered significant (K. Edwards, personal communication, July 30, 2014).

Regression analysis was utilized to answer research question number three. The purpose of the F value statistic is to test the overall significance of the regression model. It is the ratio of the mean regression sum of squares divided by the mean error sum of squares. The t statistic is a measure of the likelihood that the actual parameter

value is not zero. The larger the value of t, the less likely the actual parameter is zero (K. Edwards, personal communication, July 30, 2014).

Research Questions

The final results of this study included detailed analysis of independent and dependent variables intended to answer the research questions. Those questions included:

1. For non-special education, tier 3 first-grade students, who participated in Reading Recovery, or Leveled Literacy Intervention, or a combination of both interventions: which of these three interventions have brought students to the end-of-first-grade Development Reading Assessment (DRA) benchmark when controlled for initial DRA level, gender, ethnicity, and free or reduced lunch rate?
2. For non-special education, tier 3 first-grade students who achieved grade level status during their first-grade year, after participating in Reading Recovery, Leveled Literacy Intervention, or a combination of both programs: what percentage of students continued to reach the end-of-second-grade Development Reading Assessment (DRA) benchmark when controlled for initial DRA level, gender, ethnicity, and free or reduced lunch rate?
3. For non-special education, tier 3 first-grade students, is there a growth difference, as measured by a gain in DRA reading levels, in reading achievement based on their participation in Reading Recovery, Leveled

Literacy Intervention, or a combination of both programs; when controlled for initial DRA level, gender, ethnicity, and free or reduced lunch rate?

Sample Demographics

The total sample was comprised of 631 students who participated in a first-grade early literacy intervention. Of those students: 315 were male and 316 were female; 329 received a free or reduced lunch rate, and 302 paid full lunch price; 426 were White, 84 were Black, and 121 were Other. Of the total sample, 240 students successfully met the end-of-first-grade benchmark and were included in the longitudinal aspect of the study. The results that follow are based only on 618 of the 631students, because only students who completed a full intervention cycle were included in the test data.

Research Question #1

Research Question #1 asked: For non-special education, tier 3 first-grade students, who participated in Reading Recovery, or Leveled Literacy Intervention, or a combination of both interventions: which of these three interventions have brought students to the end-of-first-grade Development Reading Assessment (DRA) benchmark when controlled for initial DRA level, gender, ethnicity, and free or reduced lunch rate.

The stated null hypothesis for research question #1 is: $H1_0$: There is no difference between Reading Recovery, Leveled Literacy Intervention, or the combination of both interventions in terms of meeting the end-of-first-grade benchmark and the

initial DRA level, gender, ethnicity, and free or reduced lunch rate will not affect which students met the end-of-first-grade benchmark.

Percentages of students meeting the end-of-year grade level DRA benchmark were utilized to determine the effectiveness of the early literacy intervention programs. To answer Research Question #1, the first analysis was a cross tabulation. For the students who participated in a first-grade early literacy intervention, 38.8% (240 of 618 students) met the end-of-year first-grade DRA 18 benchmark. For students who participated in only Reading Recovery, 47.1% (115 of 244 students) met the end-of-first-grade benchmark. For students who participated in only Leveled Literacy Intervention, 35.3% (85 of 241 students) met the end-of-first-grade benchmark. For students who participated in both Reading Recovery and Leveled Literacy Intervention, 30.1% (40 of 133 students) met the end-of-first-grade benchmark.

Table 5

Cross tabulation of student DRA scores at the end of Grade 1 by reading intervention

Intervention	*M*	*DRA Level*	*SD*	% Meeting Benchmark
RR	15.22	16	5.11	47.1%
LLI	14.18	14	5.76	35.3%
Both	13.54	14	4.25	30.1%

Note. DRA Level is the actual DRA level, as the Mean DRA is the result of a mathematical equation and is not an actual DRA level. Only students with all four covariates (kindergarten DRA score, gender, ethnicity, and lunch rate) reported were included in the findings.

Table 6

Initial DRA level breakdown by reading intervention

DRA Level (Fall 2011)	RR		LLI		Both	
	%	*N*	%	*N*	%	*N*
DRA A/.5	1.4	3	2.3	5	4.3	5
DRA 1	13.9	29	8.8	19	10.3	12
DRA 2	31.3	65	12.0	26	27.4	32
DRA 3	36.5	76	29.5	64	36.8	43
DRA 4	14.9	31	41.5	90	19.7	23
DRA 6	1.4	3	4.1	9	1.7	2
DRA 8			.9	2		
DRA 10			.5	1		
DRA 16	.5	1				
DRA 18			.5	1		

Table 7

End-of-First-Grade DRA levels by reading intervention

DRA Level (Spring 2012)	RR		LLI		Both	
	%	*N*	%	*N*	%	*N*
DRA A/.5			.4	1		
DRA 1			.8	2		
DRA 2			1.2	3		
DRA 3	.8	2	1.6	4	.8	1
DRA 4	4.5	11	4.1	10	2.3	3
DRA 6	4.5	11	4.1	10	6.0	8
DRA 8	3.3	8	4.6	11	6.8	9
DRA 10	7.0	17	11.6	28	11.3	15
DRA 12	7.8	19	10.8	26	17.3	23
DRA 14	13.5	33	10.8	26	13.5	18
DRA 16	11.5	28	14.5	35	12.0	16
DRA 18	29.5	72	20.7	50	25.6	34
DRA 20	11.5	28	7.5	18	4.5	6
DRA 24	5.3	13	5.4	13		
DRA 28	.4	1	.8	2		
DRA 30	.4	1	.4	1		
DRA 34			.4	1		

For the purposes of this study and the district under study, the end-of-first-grade benchmark is a DRA level 18. For all first-grade students, during the 2011-12 school year, the mean end-of-year reading level was a DRA 20 (N = 2674, SD = 8.13). The mean DRA reading level for all students who participated in a first-grade early literacy intervention was a DRA 14 (N = 618, M = 14.45, SD = 5.24). For the most at-risk students, participating in a first grade literacy intervention results in significant text level growth (p = .000). More specifically, the descriptive statistics reveal that there is a statically significant difference (p = .002) in the intervention in which the student participated. For Reading Recovery students, the mean end-of-first-grade reading level was a DRA 16 (N = 244, M = 15.22, SD=5.11). For Leveled Literacy Intervention students, the mean end-of-first-grade reading level was a DRA 14 (N = 241, M = 14.18, SD = 5.76). For students who participated in both Reading Recovery and Leveled Literacy Intervention, the mean end-of-first-grade reading level was a DRA 14 (N = 133, M = 13.54, SD = 4.25). A chi square analysis revealed that students in Reading Recovery only are more likely to reach benchmark than students who participated in Leveled Literacy Intervention only or both Reading Recovery and Leveled Literacy Intervention χ^2 (2) =12.656, p=.002. Please note that the DRA levels were rounded to match actual DRA reading levels. Mathematically, the mean DRA for Reading Recovery is 15.22 but the official DRA levels are DRA 14 and DRA 16 (Beaver, 1999). Therefore, the mean DRA level for RR was rounded up to a DRA 16. Mathematically, the mean DRA for Leveled Literacy Intervention is 14.18 and as a result the nearest DRA text level is a DRA 14. Therefore, the actual mathematical difference between RR and LLI is 1.04 text level.

Only students with all four covariates—kindergarten pre-test DRA score, gender, ethnicity, and lunch rate—were included in Table 8 and were utilized in the calculation of the adjusted mean data. The missing covariate data was a result of incomplete data from the district under study, and likely due to some students completing their kindergarten year outside the district under study. The mean DRA levels that include all data, both complete and incomplete, result in the "unadjusted" DRA levels. The mean DRA levels that only include data from a complete data set, meaning all four covariates were present, are reported as the "adjusted" DRA level. The adjusted DRA level is superior because the information is comprised of a complete data set. Table 8 data is comprised of end-of-first-grade data (spring 2012). When adjusted for each covariate, the mean DRA level for Reading Recovery is a DRA level 16 (unadjusted DRA level 14), the mean adjusted and unadjusted DRA level for Leveled Literacy Intervention is DRA level 14, and the mean adjusted and unadjusted DRA level for both RR and LLI is DRA level 14. Table 6 is comprised of fall-of-first grade data and shows the following breakdown of student participants with an initial DRA text level A/.05 – DRA 3: RR had 83.1% (n = 173), LLI had 52.6% (n = 114) and both RR and LLI had 78.8% (n = 92). Note, second round students may still have qualified as tier 3 students if their fall 2011 score was a DRA 4+ but they did not make adequate growth during the first half of the school year. RR students with their pre-test data intact primarily began with moderately lower kindergarten pre-test (spring 2011) DRA scores. This RR subset also made greater gains than RR students who did not have kindergarten pre-test data, as well as the other two intervention groups, LLI only and both RR and LLI.

The estimated marginal means reveals the mean response for each factor, when adjusted for other variables in the model. Therefore, when randomly assigned, the factors will be independent. In the case of this study, the participants were not randomly assigned but three of the four demographic covariates--ethnicity, gender, or free or reduced lunch rate--were not factored into the student selection process. Therefore, the estimated marginal means showed whether or not the covariates had an overall effect on the mean DRA level.

Table 8

Estimated Marginal Means of Student DRA Scores at the End of Grade 1 by Reading Intervention

				95% CI	
Reading Intervention	*M*	*DRA*	*Std. Error*	LL	UL
RR	15.188	16	.344	15.006	16.357
LLI	13.905	14	.336	13.246	14.565
Both	13.944	14	.449	13.062	14.826

Note. M = mean (raw score); CI = confidence interval; LL = lower limit; UL = upper limit. Only students with all covariates are included.

A one-way ANOVA covariate analysis was conducted on the students who participated in a first-grade early literacy intervention. When controlling for each student's initial reading level, as defined as their spring 2011 kindergarten DRA scores, the statistics clearly showed a significant difference in their end-of-first-grade reading level, $F(1,2) = 79.777$, $p = .000$ with an R^2 value of .143 and an error of 527. When controlling for the students' gender there was not a significant difference in

their end-of-first-grade reading level, $F(2,1) = 4.906$, $p = .008$. The model variance was $R^2 = .019$ and the error was 612. When controlled for the students' ethnicity (Black, Other) there was not a significant difference in their end-of-first-grade reading level, $F(2, 2) = 1.548, 2.712$, Black $p = .214$, Other $p = .067$ with an R^2 value of .034 and an error of 609. When controlling for the students' socio-economic status, based on whether or not they receive a free- or reduced-rate lunch, there was a significant difference in their end-of-first-grade reading level, $F(2,1) = 5.416$, $p = .005$ with an R^2 value of .033 and an error of 612. The socio-economic status of a child predicts end-of-kindergarten and end-of-first-grade literacy scores. Students in poverty are predicted to have significantly lower DRA scores. After participation in a first-grade literacy intervention, the child's socio-economic status does not predict his or her end-of-first-grade literacy achievement growth ($p = .283$ and $p = .483$).

Table 9

ANCOVA Results and Descriptive Statistics for End-of-Grade 1 DRA Score by Reading Intervention, Demographics, and Kindergarten DRA Scores

	DRA Scores			
	Observed Mean	Adjusted Mean	*SD*	*N*
RR	15	16	5.09	202
LLI	14	14	5.55	214
Both	14	14	4.28	115

Source	*SS*	*df*	*MS*	*F*	*p*-value
Intervention	364.61	2	182.31	7.958	.000
Male	8.32	1	8.32	.363	.547
Black	2.06	1	2.06	.090	.765
Other Ethnicity	7.97	1	7.97	.348	.556
Free/Reduced Price Lunch	26.44	1	26.44	1.154	.283
Kdg DRA	1708.86	1	1708.86	74.592	.000
Error	11981.57	523	22.91		

Note. R^2 = .135; SS = Sum Squares; *df* = degrees of freedom; MS = Mean Square; F = Frequency; p-value = significance

The one-way ANCOVA tested the significance of the covariates on the reading outcomes, based upon the first-grade literacy intervention in which the students' participated. The end-of-kindergarten score (p = .000) remains the strongest predictor of end-of-first-grade reading success. The lowest scoring students in kindergarten tend to also be the lower scoring students at the completion of first grade. The covariates of gender (p = .547), ethnicity (Black p = .765 and Other p = .556), and free or reduced lunch rate (p = .283) were not statistically significant.

This study examined which of the three early literacy interventions most successfully aided students in achieving the end-of-first-grade DRA 18 benchmark. For Reading Recovery, 47.1% (n=115) of participants achieved the end-of-first-grade benchmark. For Leveled Literacy Intervention, 35.3% (n=85) of participants achieved

the end-of-first-grade benchmark. For the combined RR and LLI group, 30.1% (n = 40) of participants achieved the end-of-first-grade benchmark. Research question three will conduct a regression model to look at the student text level growth difference when broken down by the intervention(s) in which the students participated. As anticipated, the end-of-kindergarten DRA level remains the strongest predictor of end-of-first grade reading success (p = .000) because the lowest achieving students tend to still score below their peers, even after participation in an intervention. The covariate ethnicity it is not a significant predictor of the child's end-of-first-grade DRA level (Black p = .214, Other p = .067). Nor is the covariate gender, a significant predictor of the child's end-of-first-grade DRA level (p = .008). Finally, the covariate of free or reduced or full lunch rate does significantly predict a child's end-of-first-grade DRA level (p = .005).

The H1 null hypothesis is rejected. Students who participated only in Reading Recovery had the greatest percentage of students meeting the end-of-first-grade benchmark. Also, two of the demographic factors—initial DRA level and free or reduced lunch rate—did significantly affect the students who met the end-of-first grade benchmark.

Research Question #2

Research Question #2 asked: For non-special education, tier 3 first-grade students who achieved grade level status during their first-grade year, after participating in Reading Recovery, Leveled Literacy Intervention, or a combination of both programs: what percentage of students continued to reach the end-of-second-grade

Development Reading Assessment (DRA) benchmark when controlled for initial DRA level, gender, ethnicity, and free or reduced lunch rate?

The stated null hypothesis for research question #2 is: $H2_0$: There is no difference in the percentage of students who will continue to meet the end-of-second-grade benchmark, regardless of their participation in Reading Recovery, Leveled Literacy Intervention, or a combination of both interventions and the initial DRA level, gender, ethnicity, and free or reduced lunch rate will be not affect which students met the end-of-second-grade benchmark.

To answer Research Question #2, the first analysis was a cross tabulation. The end-of-first-grade benchmark, in the district under study, is a DRA 18, and the end-of-second-grade benchmark is a DRA 30. Of the total first-grade sample (N = 618), 38.8% (n=240) participated in an early literacy intervention and met the end-of-first-grade benchmark. For the students who met the end-of-year benchmark at the conclusion of first grade, 58.7% (128 of 218 students) met the end-of-year benchmark at the conclusion of second grade. It is important to note that 22 students were removed from the sample in second grade due to incomplete data, likely from the students' transfer out of district.

The Research Question #2 cross tabulation was then broken down by intervention group—RR only, LL only, both RR and LLI. For those students who participated in Reading Recovery as their first-grade intervention, and met end-of-first-grade benchmark, 57.4% (n = 58) were able to maintain their growth and met the end-of-second-grade DRA 30 benchmark. For those students who participated in

Leveled Literacy Intervention as their first-grade intervention, and met end-of-first-grade benchmark, 62.8% (n = 49) were able to maintain their growth and met the end-of-second-grade benchmark. For those students who participated in both Reading Recovery and Leveled Literacy Intervention, and met end-of-first-grade benchmark, 53.8% (n = 21) were able to maintain their growth and met the end-of-second-grade benchmark. Therefore, regardless of the first grade early literacy intervention model in which students participated, about 58% of students who met the end-of-first-grade DRA 18 benchmark went on to meet the end-of-second-grade DRA 30 benchmark.

A one-way ANOVA covariate analysis was conducted on the students who met the end-of-first- and second-grade benchmarks after participating in a first-grade early literacy intervention. When controlled for the students' initial reading levels, as defined as their spring 2011 kindergarten DRA scores, there was not a significant difference in their end-of-second-grade reading levels, $F(1,2) = .929$, $p = .336$ with an R^2 value of .006 and an error of 191. When controlled for the students' gender, there was not a significant difference in their end-of-second-grade reading levels, $F(2,1) = .454$, $p = .635$ with an R^2 value of .005 and an error of 212. When controlled for the students' ethnicity, there was not a significant difference in their end-of-second-grade reading levels, $F(2,2) = .312$, = .632, Black p = .732, Other p = .533 with an R^2 value of .014 and an error of 209. When controlled for the students' socio-economic status, based on whether or not they receive a free or reduced rate lunch, there was not a significant difference in their end-of-second-grade reading level, $F(2,1) = .651$, $p = .523$ with an R^2 value of .030 and an error of 212.

For Research Question #1, the covariates of initial DRA level, gender, ethnicity, and free or reduced lunch rate were reviewed to determine if the intervention type mattered in relation to the covariant. The children's initial DRA level ($p = .000$) and a free or reduced lunch rate ($p = .005$) are significant predictors of their end-of-first-grade DRA levels. However, neither the children's gender ($p = .008$) nor their ethnicity (Black $p = .214$, Other $p = .067$) are predictors of their end-of-first-grade DRA level. Since all children in research question 2 have achieved the end-of-first-grade DRA 18 benchmark, it was anticipated that the four covariates would not impact the children's' ability to reach the end-of-second-grade DRA 30 benchmark. This prediction was correct and none of the covariates were significant – initial DRA level ($p = .336$), gender ($p = .635$), ethnicity (Black $p = .732$, Other $p = .533$) and free or reduced lunch price ($p = .523$). The results showed that the covariant does not matter in relation to the intervention type for students who continued on to also meet the end-of-second-grade benchmark.

The research question #2 data revealed that for the students who participated in a first-grade early literacy intervention and met the end-of-first-grade DRA 18 benchmark, 58.7% of those students also met the end-of-second-grade DRA 30 benchmark. Although the research question did not focus on the mean, it provides an important piece of information when considering the effectiveness of the early literacy interventions. For the students who participated in a first-grade early literacy intervention and met the end-of-first-grade benchmark, the mean DRA level at the conclusion of second-grade was a DRA 30. For those who participated in Reading Recovery, the mean end-of-second-grade DRA level was a DRA 30 ($SD = 5.34$). For

those who participated in Leveled Literacy Intervention, the mean end-of-second-grade DRA level was a DRA 30 (SD = 5.81). Finally, for those who participated in both Reading Recovery and Leveled Literacy Intervention, the mean DRA level was a DRA 28 (SD = 4.92).

The research asked the same question two different ways, percentage-reaching threshold and mean DRA level, and received the same result. While there is not a significant difference amongst the intervention type and the end-of-second-grade outcome, it is important to note that the Reading Recovery only and Leveled Literacy Intervention only groups met the benchmark whereas the both Reading Recovery and Leveled Literacy Intervention group did not meet the benchmark.

Table 10

ANCOVA Results and Descriptive Statistics for Grade 2 DRA Score by Reading Intervention and Demographics for Students Who Met End-of-First-Grade Benchmarks

	DRA Scores			
	Observed Mean	Adjusted Mean	*SD*	*N*
RR	30	30	5.34	101
LLI	30	30	5.80	78
Both	28	28	4.92	39

Source	*SS*	*df*	*MS*	*F*	*p*-value
Intervention	154.10	2	77.049	2.424	.091
Male	7.994	1	7.994	.252	.617
Black	.107	1	.107	.003	.954
Other Ethnicity	.573	1	.573	.018	.893
Free/Reduced Price Lunch	3.000	1	3.000	.094	.759
Kdg DRA	55.073	1	55.074	1.733	.091
Error	5943.4	187	31.783		

Note. $R^2 = .039$

For those students who met the end-of-first-grade DRA 18 benchmark, 58.7% also met the end-of-second-grade DRA 30 benchmark. The longitudinal aspect of the study revealed that all three intervention groups achieved a similar percentage of students meeting the end-of-second-grade benchmark (RR achieved 57.4%, LLI achieved 62.8%, both RR and LLI achieved 53.8%) and therefore the $H2_0$ null hypothesis is rejected. It appears that regardless of the initial intervention type in which a child participates, once they know how to read they are able to maintain that growth trend at a degree that is similar amongst the three intervention groups. Additionally, the $H2_1$ hypothesis is also rejected because LLI had the greatest percentage of students maintaining grade level achievement through the conclusion of second grade.

Table 11

Intervention Students Who Successfully Met Both 1st (DRA 18) and 2nd (DRA 30) Grade End-of-Year Reading Benchmarks

DRA Level (Spring 2013)	RR		LLI		Both	
	%	*N*	%	*N*	%	*N*
DRA 30	29.7	30	28.2	22	38.5	15
DRA 34	11.9	12	17.9	14	12.8	5
DRA 38	8.9	9	12.8	10	2.6	1
DRA 40+	7.0	7	3.9	3		

Research Question #3

Research Question #3 asked: For non-special education, tier 3 first-grade students, is there a growth difference, as measured by a gain in DRA reading levels, in reading achievement based on their participation in Reading Recovery, Leveled Literacy Intervention, or a combination of both programs; when controlled for initial DRA level, gender, ethnicity, and free or reduced lunch rate?

The stated null hypothesis for research question #3 is: $H3_0$: No difference exists in reading achievement among students participating in Reading Recovery, Leveled Literacy Intervention, or a combination of both, when controlled for fall first-grade DRA text level, gender, ethnicity, and free or reduced lunch rate.

The stated alternative hypothesis for research question #3 is: $H3_1$: Differences exist in reading achievement among students participating in Reading Recovery, Leveled Literacy Intervention, or a combination of both, when controlled for fall first-grade DRA text level, gender, ethnicity, and free or reduced lunch rate.

When the initial DRA levels are broken down by intervention, it is important to note that 83.2% (n = 76) of Reading Recovery students completed kindergarten at a DRA 3 or below, 52.5% (n = 64) of LLI students completed kindergarten at a DRA 3 or below, and 78.6% (n = 43) of the RR and LLI combination group completed kindergarten at a DRA 3 or below. See Tables 6 and 11 for end-of-kindergarten (pre-test) and end-of-first-grade DRA level breakdowns by intervention type. The students who have a kindergarten DRA level at or above DRA 4 are second round students and their intervention qualification scores are based on January of first grade.

Regression analysis generates an equation that describes the relationship between one or more predictor variable(s) and the response variable. To predict the difference in reading achievement based on the first-grade intervention type, the Grade 2 spring DRA data – Grade 1 fall data was utilized. This resulted in a $R^2 = .061$ score. Therefore, very little of the difference score is explained by the variables included in the model. This is reflected in Tables 6 and 12.

The constant (intercept) reflects the average difference score based on the control group that is comprised of white females receiving both Reading Recovery and Leveled Literacy Interventions, with an average end-of-kindergarten DRA score. For the control group an average DRA improvement of almost 10 DRA reading levels (β = 9.67 levels) was achieved (SD = .73, t = 13.26, p = .000). Therefore, on average, students are increasing their reading levels between first and second grades.

For every DRA level gain based on the kindergarten pre-test, the expected result is a .665 DRA reading level increase on the difference score. When holding all other variables constant the result is highly significant (SD = .16, t = 4.15, p<.001). Males did not significantly score better than females on their difference score (β = .43). Compared to Whites, ethnicity was not a significant factor on the difference score (Black β = -.29, Other β = -.46). Students who receive free or reduced lunch rates do not have a significantly lower difference score than those who pay the full lunch rate (β = -.32).

The first half of research question 3 asks if there is a growth difference, as measured by a gain in DRA reading levels, in reading achievement based on their

participation in Reading Recovery, Leveled Literacy Intervention, or a combination of both programs. For the regression model, the combination group of RR and LLI was used as the reference group. Reading Recovery students had an average difference score 1.70 higher than the both RR and LLI intervention group. This was significantly higher (β = 1.70, t = 2.98, p = .003). Therefore, even when controlling for initial DRA level, gender, ethnicity, and free or reduced lunch rate, Reading Recovery students achieve significantly higher DRA levels by the end of second grade. Leveled Literacy Intervention students have an average difference score that is -.298 lower than the both RR and LLI intervention group. This was not significant (β = -.30, t = -.514, p = .607). Therefore, even when controlling for initial DRA level, gender, ethnicity, and free or reduced lunch rate, LLI students do not significantly surpass the combination RR and LLI group (p = .877). Thus, the Reading Recovery intervention is also significantly higher than the LLI intervention (p = .002). Therefore, the only early literacy intervention that made a statistically significant difference was Reading Recovery. (See Tables 12 and 13 for a detailed analysis.)

Table 12

Multiple Regression Predicting End-of-Grade 1 DRA Scores for Students Receiving Intervention

Variable	β	*SE*	*t*-value	*p*-value
Intercept	9.67	.729	13.26	.000
Male	.431	.426	1.013	.312
Black	-.294	.702	-.419	.675
Other Ethnicity	-.456	.593	-.770	.442
Free/Reduced Price Lunch	-.318	.453	-.702	.483
LLI	-.298	.580	-.514	.607
RR	1.704	.572	2.977	.003
DRA Pre-Test	.665	.160	4.145	.000

Note. $R^2 = .061$

This study is comprised of tier 3, non-special-education students who participated in Reading Recovery, Leveled Literacy Intervention, or a combination of both RR and LLI. Table 6 shows that Reading Recovery students began the intervention with a range of DRA A/.5 through DRA 16. Of those students, 83.1% (n = 173) began the Reading Recovery intervention with a fall of first-grade DRA level between A/.5 and DRA 3. Leveled Literacy Intervention students began the intervention with a range of DRA A/.5 through DRA 18, which happens to be the end-of-first-grade DRA level. Of those students, 52.6% (n = 114) began Leveled Literacy Intervention with a fall of

first-grade DRA level between A/.5 and DRA 3. Students in the combination RR and LLI group began the intervention with a range of DRA A/.5 through DRA 6. Of those students, 78.8% (n = 92) began the combination RR and LLI group with a fall of first-grade DRA level between A/.5 and DRA 3.

The students who participated in the combination of RR and LLI were much more difficult to teach, and 69.9% (n = 93) of students in this combination group did not respond to either intervention and did not meet the end-of-first-grade DRA 18 benchmark. The district under study does not identify the round of Reading Recovery nor the round of Leveled Literacy Intervention in which the students participated. Students who participated in Reading Recovery first, almost certainly did not discontinue from Reading Recovery and were enrolled in Leveled Literacy Intervention to provide additional scaffolding and support (district representative, 2014). Students who participated in Leveled Literacy Intervention first, were given an opportunity to expand their foundational skills including alphabetic (letter) knowledge, phonemic awareness, rich vocabularies (Wren, 2014), strong book knowledge skills and an intrinsic motivation to read before beginning Reading Recovery as a second-round student.

Table 13

Multiple Comparisons of Early Literacy Interventions

Reading Intervention	*Mean Difference*	*Std. Error*	*Sig.*	95% CI LB	95% CI UB
RR to LLI	1.5502	.46090	.002	.4672	2.6332
RR to Both	1.8161	.53515	.002	.5586	3.0735
LLI to Both	.2659	.54390	.877	1.0122	1.5439

Note. CI = confidence interval; LL = lower bound; UL = upper bound.

Since Reading Recovery participants significantly perform better than the LLI group (p = .002) and the both RR and LLI group (p = .002, p = .003), the first half of the H3 null hypothesis is rejected and the first half of the H3 alternative hypothesis is not rejected. The second half of the H3 null and alternative hypotheses are rejected for initial kindergarten DRA level (β = -.665, p = .000). However, the covariates of gender (β = .431, p = .312), ethnicity (Black β = -.294, p = .675, Other β = -.456, p = .442), and socio-economic status (β = -.318, p = .483) are not significant. The R^2 = .061 shows that very little of the difference score is explained by the covariates. Again, as expected, when students begin first grade significantly behind their peers, it is expected that the majority will continue to struggle to maintain average reading levels, even after completing a first-grade literacy intervention.

Chapter Conclusion

For the school year 2011-12, this study followed tier 3, non-special education first-grade students through three early literacy interventions. The analysis shows that Reading Recovery is the intervention that will most likely see the greatest text level growth and have the most students meet the end-of-first-grade DRA 18 benchmark ($p = .003$). For students who participated in Reading Recovery, 47% students met the benchmark. For students who participated in Leveled Literacy Intervention, 35% of students met the benchmark. For those who participated in a combination of RR and LLI, 30% of students met the end-of-first-grade benchmark.

The results also demonstrate that regardless of gender or ethnicity, the most at-risk of students are making reading achievement gains after participating in Reading Recovery, Leveled Literacy Intervention, or in a combined group of both RR and LLI. About 40% of students in poverty, who have not received an early literacy intervention, have below basic reading scores (NAEP, 2011). For all first-grade students in the district under study during the 2011-12 school year, 40% ($N = 1340$ of 3336 students) received a free or reduced price lunch rate. Of those students who received a free or reduced price lunch, 329 students also participated in a tier 3 early literacy intervention. After one year of RR, LLI or a combination of both, participation in the intervention can completely eliminate the achievement gap for 36% of students regardless of gender or ethnicity.

The kindergarten DRA level remains the strongest predictor of first- and second-grade reading success. The lowest scoring students in kindergarten tend also to be the

lower scoring students in first and second grades. However, the research questions in this study focused on investigating whether Reading Recovery, Leveled Literacy Intervention, or a combination of both RR and LLI can bring those lowest scoring students up to grade level benchmarks successfully. The analysis shows that the Reading Recovery intervention was likely to result in students moving up to grade level benchmarks (results statistically significant at $p = .003$). The LLI intervention was not shown to be a strong predictor of success ($p = .607$), nor was the combination of RR and LLI ($p = .877$). Additionally, ethnicity (Black $p = .675$, Other $p = .442$) and gender (Male $p = .312$) were not found to be statistically significant factors. Poverty, based on a child's school lunch rate, was found to be statistically significant at the conclusion of first grade ($p = .005$) but not statistically significant when an ANCOVA analysis of variance adjusted the data to only include participants with a complete kindergarten through second-grade data set ($p = .283$). Poverty was not found to be statistically significant for second-grade children who had achieved the end-of-first-grade benchmark ($p = .523$) nor on the child's fall of first-grade through spring of second-grade text level growth ($p = .483$). A child's free or reduced lunch rate is not a predictor of their future growth trend. Moving forward, Chapter Five discusses the implications of the study findings.

Chapter V: Discussion, Implications, Recommendations

Introduction

Chapter Five discusses the implications of the study's findings. The chapter begins with an overview of the study followed by insights derived from the study's findings. The chapter concludes with recommendations for school district literacy practitioners and administrators as well as recommendations for future academic studies.

Overview of the Study

Throughout the history of education, stakeholders at every level have sought to provide an effective and challenging educational system that meets the diverse needs of all students. To accomplish this task Congress has enacted laws that are intended to hold educational systems, and their educators, to high standards and levels of accountability (ESEA, 2011; NCLB, 2001).

It is estimated that 75-80% of American students successfully reach grade level benchmarks through tier 1 (classroom) instruction (http://rtinetwork.org/, 2013; Shapiro, 2013). Students who receive tier 2 interventions have below grade level benchmarks, but do not require the intense interventions of tier 3 students who are

significantly below grade level and are at risk for not reaching the grade level benchmarks and possibly qualifying for special education services (http://rtinetwork.org/, 2013; Shapiro, 2013). The purpose of this study was to look at three early literacy intervention approaches—Reading Recovery, Leveled Literacy Intervention, and both Reading Recovery and Leveled Literacy Intervention—to determine their effectiveness at bringing first-grade tier 3 non-special education students to the end-of-first-grade benchmark, maintain that growth through the conclusion of second grade, and to answer the important question of a child's rate of reading level achievement based on participation in a particular early literacy intervention. For the purposes of this study, tier 3 first-grade students were defined as students with a fall first grade DRA level A/.05-3. The study was controlled for four variables—students' initial DRA level, gender, ethnicity, and free or reduced lunch rate.

Reading Recovery (RR) is a tier 3, one-on-one, intensive early literacy intervention program designed specifically for first-grade students. This program focuses on children who are about six or seven years of age, because young children may be able to more easily overcome their literacy struggles if they have practiced erroneous behaviors less often (Clay, 1979; New Zealand Ministry of Education on Reading Recovery, 2003). RR lessons occur for 30 minutes a day (Rhodes-Kline, 1996) for an average of 20 weeks (RRCNA, 2013). The routines are established but the teacher is highly trained to follow the child's lead and to match what the child needs for acceleration throughout the lesson series (Clay, 2005; RRCNA, 2013).

Leveled Literacy Intervention (LLI) is a tier 2 or tier 3, short-term, small group (ideally three students) literacy intervention for students in Grades K-4 (Fountas & Pinnell, 2009; Heinemann.com, 2013). The goal of LLI is to get students to grade level proficiency before long-term literacy deficits are established (Harrison et al., 2008). LLI lessons are 30 minutes, five days a week in Grades K-2, and 45 minutes, four days a week in third and fourth grades. The lessons last an average of 18-20 weeks (Fountas & Pinnell, 2013; Harrison, et al., 2008), but the program does not establish either a minimum or maximum number of weeks for participation. LLI is most commonly utilized as a tier 2 intervention (Fountas & Pinnell, 2013), but this study looked at its effectiveness as a tier 3 literacy intervention. Heinemann (2013), the publishers of LLI shared, "This short term intervention system can be used in different intensities and/or tiers, depending on student need" (Alignment of Instruction Approaches section, para.5).

The Developmental Reading Assessment (DRA) is an individually administered assessment of a child's reading capabilities. A child's DRA independent text level reading score includes mastery of accuracy, fluency, and comprehension at a score of 90% or above (Beavers, 1999; Scholastic, 2014). For the purposes of this study, the DRA was utilized as the sole measurement tool.

Research Questions

During the course of this study, the following research questions guided the investigation:

1. For non-special education, tier 3 first-grade students, who participated in Reading Recovery, or Leveled Literacy Intervention, or a combination of both interventions: which of these three interventions have brought students to the end-of-first-grade Development Reading Assessment (DRA) benchmark when controlled for initial DRA level, gender, ethnicity, and free or reduced lunch rate?
2. For non-special education, tier 3 first-grade students who achieved grade level status during their first-grade year, after participating in Reading Recovery, Leveled Literacy Intervention, or a combination of both programs: what percentage of students continued to reach the end-of-second-grade Development Reading Assessment (DRA) benchmark when controlled for initial DRA level, gender, ethnicity, and free or reduced lunch rate?
3. For non-special education, tier 3 first-grade students, is there a growth difference, as measured by a gain in DRA reading levels, in reading achievement based on their participation in Reading Recovery, Leveled Literacy Intervention, or a combination of both programs; when controlled for initial DRA level, gender, ethnicity, and free or reduced lunch rate?

Conclusions

This study was comprised of (N = 631) tier 3, non-special education first-grade students. Overall, regardless of intervention type, 38.8% (n = 240) first-grade students, who participated in one of three interventions, met the end-of-first-grade benchmark. For students who participated in Reading Recovery, 47.1% (n = 115) met the end-of-first-grade benchmark. For Leveled Literacy Intervention, 35.3% (n = 85) of students met the end-of-first-grade benchmark. For students who participated in both Reading Recovery and Leveled Literacy Intervention, 30.1% (n = 40) met the end-of-first-grade benchmark. As a comparison, for all students in the grade level who did not qualify for a first-grade intervention (N = 2,056) based on an average or above average fall DRA score, 80.3% (n = 1,651) met the end-of-first-grade benchmark.

Research Question #1

Cross tabulation analyses of research question #1 show that in its most simplistic form, the Reading Recovery group was more likely to reach the end-of-first-grade benchmark than the Leveled Literacy Intervention group or the combination of both RR and LLI χ^2 (2) =12.656, p=.002. Table 12 shows that when a Multiple Regression test is conducted, the only intervention achieving significant growth is Reading Recovery (p = .002 and p = .003).

The four covariates in the study were initial kindergarten DRA level, gender, ethnicity, and socio-economic status based on the participants' free and reduced lunch rates. The kindergarten DRA score was the strongest predictor of the participants'

end-of-first-grade DRA levels (p = .000). The most at-risk students initially tend to struggle to reach and/or maintain grade-level benchmarks as compared to their peers who began their literacy journey with a stronger initial foundation. Gender (p = .008) and ethnicity (Black p = .214, Other p = .067) are not significant predictors of the participants' end-of-first-grade reading level. Socio-economic status, based on a child's school lunch rate, was found to be statistically significant at the conclusion of first grade (p = .005) but not statistically significant when an ANCOVA analysis of variance adjusted the first-grade analysis to only include participants with a complete kindergarten and second-grade data set (p = .283).

Table 14 shows the mean end-of-year DRA levels, broken down by intervention, for kindergarten through second grade. Reading Recovery students began academically below their counterparts in LLI and statistically similar to students in both RR and LLI. The RR students made a greater gain in first grade; and while the mean score did not reach the end-of-first-grade benchmark of DRA 18, they were only one DRA level below that threshold. Table 12 shows that Reading Recovery was found to be statistically significant in area of text level growth (p = .003). The Leveled Literacy Intervention group and the both RR and LLI group each reached a mean DRA 14, which is two DRA levels below the threshold. Table 12 shows that neither the Leveled Literacy Intervention group nor the both RR and LLI group are not statistically significant in the area of text level growth (LLI p = .607, Both p = .877).

Table 14

Students Mean End-of-Year DRA Level

Intervention Type	Spring 2011 Kindergarten		Spring 2012 First Grade		Spring 2013 Second Grade	
	M	SD	*M*	SD	*M*	SD
RR	2.63	1.39	16	5.09	30	5.34
LLI	3.33	1.67	14	5.55	30	5.81
Both	2.66	1.09	14	4.28	28	4.92

Note. Second-grade students only include those who made the first-grade benchmark.

The "Matthew Effect" is a widely researched principle in early literacy. "For whoever has will be given more, and they will have an abundance. Whoever does not have, even what they have will be taken from them" (Matthew 25:29, NIV). Research has shown time and again that some children arrive at school "wealthier" in the area of reading than their peers. So what creates the division between the haves and the have nots? The greatest predictors are students who arrive in kindergarten with basic foundational skills such as alphabetic (letter) knowledge, phonemic awareness, rich vocabularies (Wren, 2014), strong book knowledge skills, and an intrinsic desire to learn how to read. Struggling students who do not arrive with foundational skills but possess the desire to become readers may join their "wealthier" peers in making tremendous gains in kindergarten and first-grade because

they are willing to devote the time and effort necessary to acquiring this new skill (Guthrie & Wigfield, 1997).

The research showed that the strongest predictor of end-of-first-grade reading level is the initial end-of-kindergarten reading level. The most at-risk students have the greatest gains to make and even after participating in an early literacy intervention, they will likely need continued support to reach and/or maintain grade level reading status. According to Table12, Reading Recovery was the only early literacy intervention to make significant text level gains ($p = .003$). Table 14 shows that students in RR only will anticipate the greatest text level gains, followed by those who participated in LLI only ($p = .607$) and lastly the both RR and LLI group ($p = .877$).

For a student to solidly master a text level, the student must read the text with accuracy and fluency, and be able to comprehend the text (Beaver, 1999). None of the intervention groups—Reading Recovery, Leveled Literacy Intervention, both RR and LLI—had a mean end-of-first-grade DRA level that met the DRA 18 benchmark. Reading Recovery had an end-of-first-grade mean DRA 16. Leveled Literacy Intervention had an end-of-first-grade mean DRA 14. The both RR and LLI group had an end-of-first-grade mean DRA 14. An important note from Table 5 shows that those in LLI are solid at a DRA 14 at the conclusion of first-grade, while those in the both RR and LLI group are solid at a DRA 12 but they are actually given the DRA 14 level due to a rounding up of statistics.

Reading Recovery was initially implemented in the district under study in the fall of 1997. Leveled Literacy Intervention was first piloted in the spring of 2010, and full program implementation began in the fall of 2010. In the district under study, RR is a well-loved and respected institution. Reading Recovery teachers have benefited from years of systematic and effective staff development that has built loyalty and passion to the RR program and its process. No doubt, the intense teacher knowledge and passion has contributed to the on-going successful endeavors of the RR program. Reeves (2011) shared that program implementation is paramount to the success of the program. A future study may analyze what level of success LLI will reach as it grows in popularity and effective implementation, and as teachers begin to passionately support and believe in the program in a manner that is similar to their passions about RR. This passion and belief in a program can only grow through time, talent, dedication, and the actualization of true results.

One of the most enlightening and unexpected outcomes of this study surrounded the demographics. While caution must be observed because this is a one-year study, the results are encouraging and show that more longitudinal data is needed. Table 9 shows that gender ($p = .547$), ethnicity (Black $p = .765$, Other $p = .556$), and socio-economic status ($p = .283$) are not significant predictors of the child's end-of-first-grade achievement. These findings are contradictory to national achievement gap findings (Tatum, 2005). The children's initial DRA levels do significantly predict his/her end-of-first-grade DRA level ($p = .000$). For gender, ethnicity, and socio-economic status, the district under study effectively negated the anticipated demographic impacts through selected reading interventions. The study

was conducted in a large and diverse suburban district. Table 3 provides a Sample Demographic of all students participating in one of the three early literacy interventions.

Research Question #2

During the 2011-12 school year, the district under study had 2,674 first-grade students. Of those students 618 students participated in Reading Recovery, Leveled Literacy Intervention, or both RR and LLI. Of the first-grade intervention students, 38.8% (n = 240) met the end-of-first-grade DRA level 18 benchmark. Of the students who participated in a first-grade early literacy intervention and met the end-of-first-grade benchmark, 58.7% (n = 218) met the end-of-second-grade DRA 30 benchmark and maintained their grade level status. For those who participated in Reading Recovery, 57.4% maintained their grade level status. For those who participated in Leveled Literacy Intervention, 62.8% maintained their grade level status. For those who participated in both RR and LLI, 53.8% maintained their grade level status.

The intervention style is not a significant predictor of the end-of-second-grade DRA level. Given that the participants met the threshold at the end of first grade, the first-grade intervention does not predict achievement beyond first grade χ^2 (2) =.993, p=.609. According to Table 14, Reading Recovery students began with an initial mean DRA Level 3, concluded first grade with a mean DRA level 16, and concluded second grade with a mean DRA level 30. Leveled Literacy Intervention students began with an initial mean DRA Level 3, concluded first grade with a mean DRA level 14, and concluded second grade with a mean DRA level 30. The Reading

Recovery and Leveled Literacy Intervention students began with an initial mean DRA Level 3, concluded first grade with a mean DRA level 14, and concluded second grade one level behind with a mean DRA level 28, just below the grade level threshold. A possible explanation for the achievement results is that the RR intervention better prepared the students initially; but once a child knows how to read, the child is often able to continue to build upon his/her literacy foundation, regardless of the intervention program that initially taught the child how to read.

Murphy (2004) stated that realistically, some students will need additional support services to maintain their growth. As school districts look to improve their intervention success rates, they will likely review their overall early literacy intervention plan and devise one that will better meet the needs of their most struggling learners. One important component of their new plan should include a mandated scaffolding of instruction for all Reading Recovery and tier 3 Leveled Literacy Intervention students. A component of this scaffolding down approach should focus on continuing to develop independence and problem-solving techniques. For students who conclude their tier 3 Reading Recovery or LLI intervention, it is recommended that the students are required to participate in a tier 2 LLI group as the teacher gradually releases control of the students' learning. For all students who completed a tier 3, first-grade intervention, it is recommended that they continue to receive an LLI intervention into the fall of second grade. The length of their second grade intervention will vary based on the needs of individual students and the building level support resources.

An ANCOVA analysis of covariance verified that when controlled for the same covariates as research question #1—initial DRA level, gender, ethnicity, and free or reduced lunch rate—the intervention type did matter for research question #1 and does not matter for research question #2. According to this study, once the students learn how to read, they know how to read and demographic factors no longer pose a negative impact.

Research Question #3

A regression statistic is an analysis tool for forecasting the change in a dependent variable. For the purposes of this study, regression analyses were conducted to determine if there is a growth difference in reading achievement based on the early literacy intervention in which a student participates, when controlled for initial DRA level, gender, ethnicity, and free or reduced lunch rate. To find the difference scores, the regression analyses subtracted the Grade 1 fall DRA score from the Grade 2 spring DRA score (Grade 2 fall – Grade 1 spring = difference score). The variables of gender ($p = .312$), ethnicity (Black $p = .675$, Other $p = .442$) and socio-economic status (FRP $p = .483$) were found not to be significant at this point in the process. Once a child learns how to read, the child knows how to read regardless of variables that traditionally add challenges to new readers. However, even after participating in a first-grade literacy intervention, the initial kindergarten DRA level ($p = .000$) remains the strongest predictor of the end-of-first- and second-grade DRA levels. The most at-risk students in kindergarten tend to also be lower scoring students in first and second grades.

If a district is considering the acquisition and adoption of a new early literacy intervention, the programs effectiveness, philosophy, methodology, and cost must be considered. This study found Reading Recovery to be statistically significant in the area of text level growth ($p = .003$), and it found that Leveled Literacy Intervention is not statistically significant in the area of text level growth ($p = .607$). That said, it is important to note that LLI is typically utilized as a tier 2 program, but for this study it was utilized as a tier 3 program. It is anticipated that if LLI were utilized as a tier 2 program, that the results would increase. Both RR and LLI have a balanced literacy approach that is derived from the whole language ideology and includes phonics education. Both programs focus on word attack skills, reading advancement, reading for meaning, and the importance of the reciprocity between reading and writing. Reading Recovery is innately more costly because it is a one-on-one intervention that is adapted to meet the exact needs of each individual student. LLI is a small group intervention model with a complete boxed kit that includes all leveled text that are ordered by lesson and a direct instruction teacher's manual.

More research needs to be conducted into the long-term effects of LLI in a school district. It is anticipated that as teachers continue to grow in their pedagogy and understanding of the LLI system, the number of students who experience significant positive reading achievement gains will naturally increase. Thus, the teaching staff's commitment to LLI will also increase. Boyd, Lankford, Loeb, Rockoff & Wyckoff (2007) conducted extensive research on the effectiveness of new teachers. They found that experienced teachers are more effective than new teachers. However, the researchers also discovered that early in a teacher's career is when the

teacher has the highest increase in effectiveness. This finding accounts for other observable teacher-related variables such as: advanced degrees, teacher licensure scores, National Board Certification at the elementary level, and class size (Boyd et al., 2007). Boyd et al. (2007) went on to say that teachers show the greatest productivity gains during their first few years on the job. A future study could analyze if the "new teacher" effect also remains true for teachers who are new to teaching a particular method, or direct-instruction program, such as LLI or RR.

Regardless of the first-grade literacy intervention(s) a district adopts, it is recommended that the most at-risk students are provided with a quality tier 2 literacy program through the conclusion of second grade.

Implications

The results of this research study provide educational stakeholders with the necessary data to make early literacy decisions that directly impact their schools. This is the first time the district under study has supported a research study on the implications of Reading Recovery and first-grade literacy interventions. For grades 1 and 2, all three programs—Reading Recovery, Leveled Literacy, both Reading Recovery and Leveled Literacy Intervention—vary in their achievement performance. For Reading Recovery, 47.1% of first graders met the end-of-year DRA 18 benchmark and 57.4% of second graders met the end-of-year DRA 30 benchmark. For Leveled Literacy Intervention, 35.3% of first graders met the end-of-year benchmark and 62.8% of second graders met the end-of-year benchmark. For both Reading Recovery and Leveled Literacy Intervention, 30.1% of first graders met the

end-of-year benchmark and 53.8% of second graders met the end-of-year benchmark. In the area of text level growth, Reading Recovery was found to be statistically significant ($p = .003$) but neither Leveled Literacy Intervention ($p = .607$) nor the combination of RR and LLI ($p = .877$) were found to be statistically significant.

A future study should look into all three interventions–Reading Recovery, Leveled Literacy Intervention and both RR and LLI—to track which first grade students were first round (September through December or January) or second round (January through May) students. Are second round students more successful at meeting the end-of-first-grade benchmark? If so, by automatically placing tier 3 students who have completed an intense literacy intervention into a tier 2 LLI intervention, will the percentage of students who reach the end-of-first-grade benchmark dramatically increase?

Reading Recovery

"Reading Recovery is by far the most widely researched and widely used tutoring program in the world" (Slavin et al., 2009, p. 6). Research has demonstrated that the RR model is significantly effective at raising the literacy levels of at-risk first-grade students (Pressley, 2001; ReadingRecovery.org, 2014; RRCNA, 2013).

The results of Tables 5 and 14 pose a very important question: why are 73% of Reading Recovery students discontinuing but only 47% are meeting the end-of-first-grade DRA level 18 benchmark? An important future study will analyze the students found within the percentages. Are students able to transfer their Reading Recovery learning into the classroom and home setting? Are classroom teachers utilizing the same language and strategies as the Reading Recovery teachers? Of the

students who are discontinuing and meeting the end-of-year benchmark, are they second round students? What is happening to first round students? The results will likely indicate that first round students are successfully discontinuing but are not continuing to progress at a rate that will allow them to maintain their grade level status. Therefore, an automatic inclusion into a tier 2 literacy intervention will facilitate the continuation of reading growth at a rate that is similar to their average achieving peers. Finally, the classroom teachers are responsible for providing the tier 1 core literacy instruction that is necessary for all students. What procedures and processes are in place to hold classroom teachers accountable for the continued success of students who have received intensive early literacy interventions?

Table 15

Descriptive Statistics of Reading Recovery Discontinuation Rates and End-Of-Year Benchmark Achievement

Reading Recovery	% Disc.	% Non-Disc.	*% Met End-of-1st grade Benchmark*	*% Met End-of-2nd grade Benchmark*
2011	73%	27%	47%	
2012				57.5%

Note. Second grade data only includes students who successfully met the end-of-first-grade benchmark.

The cross tabulation analysis showed that 47.1% (n = 115) of Reading Recovery students met the end-of-first-grade benchmark. This percentage is 12% greater than LLI and 17% greater than the combination of both RR and LLI. Therefore, Reading Recovery is the most effective early literacy intervention in the research study χ^2 (2) =12.656, p=.002. Table 6 shows that students who participated in Reading Recovery had the lowest initial DRA levels, followed by the both RR and LLI intervention group, and lastly the Leveled Literacy Intervention group had the highest initial DRA levels. For students in the both RR and LLI intervention group, a future study should analyze the difference in achievement based on which intervention a child participates in for round 1 and round 2. For example, do students who participate in RR for round 1 and LLI for round 2 have better outcomes than those who participate in LLI for round 1 and RR for round 2? Those who participate in RR first are given the opportunity to scaffold down their instruction as their abilities and confidence grows.

One possibility to consider is student selection. By potentially selecting students who are not prepared to begin their intensive tier 3 reading journey, the results will not meet the desired outcomes. Whereas, if students are selected based upon readiness to read (know 40 letters, able to write name, left to right directionality) (Richardson, 2014), the reasonable expectation is that the RR or LLI program results will trend upwards. For the students who are entering first grade without a solid literacy foundation, intense assistance can be provided through short bursts of directed instruction. Common focus areas will include the alphabetic principle, phonemic awareness, concepts about print, and directionality. The classroom teacher, a community volunteer, or a para-educator who is trained in the 5-10 minute intervention may conduct these quick intervention bursts.

There is controversy over who should receive a burst of service or other intervention in lieu of Reading Recovery. Some districts expect students to have solid foundation skills before beginning a Reading Recovery intervention, but the Reading Recovery Council of North America (RRCNA) disagrees. The RRCNA's Standards and Guidelines of Reading Recovery in the United States, 6th edition, stated:

> Reading Recovery is designed for children who are the lowest achievers in the class/age group…Principals have sometimes argued to exclude this or that category of children or to save places for children who might seem to 'benefit the most,' but that is not using the full power of the program. It has been one of the

> surprises of Reading Recovery that all kinds of children with all kinds of difficulties can be included, can learn, and can reach average-band performance for their class in both reading and writing achievement. Exceptions are not made for children of lower intelligence, for second-language children, for children with low language skills, for children with poor motor coordination, for children who seem immature, for children who score poorly on readiness measures, or for children who have been categorized by someone else as learning disabled (p. 60).

An important future study will evaluate the educational impact of participating in Reading Recovery as a round one (September through December or January) versus a round two (January through May) student. What percentage of students meet the end-of-first-grade benchmark based upon when they participated in Reading Recovery? What supports effectively help first round students to not only maintain their growth but to continue their upward trajectories?

In addition to the data collected to answer the research questions, for Reading Recovery only, the district tracked the discontinuation (successful completion) and non-discontinuation (non-successful completion) of Reading Recovery. Discontinuation rates factor in the time of year a student participates in the program. For students in Reading Recovery from September through December or January, discontinuation is based on successfully passing An Observation Survey tasks and reading at a Reading Recovery level 12, which is the equivalent of a DRA level 12.

For students who participated in Reading Recovery from January or February through May, discontinuation is based on successfully passing An Observation Survey tasks and reading at a Reading Recovery level 18, which is the equivalent of a DRA level 18.

Table 16

Descriptive Statistics of Reading Recovery Discontinuation/Non-Discontinuation Rates

Reading Recovery	% Discontinued	*N* Discontinued	*N* Non-Discontinued
2010	73%	266	96
2011	73%	244	89
2012	80%	280	70
2013	84%	185	35
2014	86%	149	24

Reading Recovery also submits annual data to their International Data Evaluation Center (IDEC). This data provides a complete data analysis of all students serviced by Reading Recovery. The data utilized by IDEC is from An Observation Survey, which is the main test of student literacy levels for Reading Recovery. Students take An Observation Survey before and after completing the program. A student must pass all aspects of An Observation Survey in order to successfully discontinue (graduate) from Reading Recovery. Table 17 shows that discontinued

students progressed from a mean fall text level reading score of 2 to a mean spring text level reading score of 19. As a general rule, Reading Recovery teachers give An Observation Survey to approximately 20 students but only select four students each round for participation in the program. At the time of research, students who were not selected for RR were placed into alternative literacy interventions, such as LLI or an additional scope of a guided reading. The students who were tested by Reading Recovery teachers but not serviced progressed from a mean fall text level reading score of 2 to a mean spring text level reading score of 16. Therefore, RR students made a mean gain of three text levels (or two DRA levels) above their similar peers who did not receive the Reading Recovery first grade intervention.

Table 17

Progress on Reading Recovery's 2011-12 Text Level Reading in An Observation Survey

RR Completion Status	Fall			Year-End			Gain	
	N	M	*SD*	N	M	*SD*	N	M
Discontinued	306	1.6	1.2	387	19.4	3.0	294	18
Recommended Action	95	0.8	1.0	111	12.4	4.1	93	11.8
Incomplete	24	1.0	1.5	54	12.6	3.5	24	11.5
All Served	435	1.5	1.2	556	17.3	4.6	414	16.2
Complete Interventions	401	1.4	1.2	498	17.8	4.4	387	16.5
Tested Not Instructed	145	2.3	2.5	142	16.2	6.7	140	13.9

Note. Mean gain is based only on students with both fall and year-end Text Reading Level scores (Text Reading Level scores are similar to DRA scores).

Leveled Literacy Intervention

An important future study will be to evaluate the effectiveness of LLI as a stand-alone program for both tier 2 and tier 3 students. What would the educational and financial implications be if LLI was the only first-grade early literacy intervention? For round 1 students who received LLI as a tier 3 intervention, it is

highly recommended that they continue to receive LLI as a tier 2 intervention for the latter part of first-grade. What if all first-grade students who participated in LLI were mandated to be in LLI for one tier 2 round during their second-grade year? Typically, LLI is a tier 2 intervention (Heinemann, 2013). Additionally, group sizes for LLI can be flexible (Heinemann, 2013) and tier 2 groups may increase to a group size of 6 students. By continuing with LLI into second-grade, teachers will have the opportunity to gradually release the responsibility for growth and achievement to the students and provide the students with the confidence, insight, and tools to successfully flourish with core classroom instruction. For the students who continue to fall short of reaching the grade level benchmark despite participation in LLI during first and second grades, would it be appropriate to consider a special education evaluation, continue with LLI in third grade, or seek another alternative?

Table 18 demonstrates that regardless of intervention type, nearly 25% (n = 156) of first-grade intervention students almost met the end-of-year benchmark. For second grade students, regardless of intervention type the child participated in, 35.3% (n = 77) of students almost met the end-of-year benchmark. Therefore, if a student met the end-of-first-grade benchmark but is loosing ground in second grade, LLI is uniquely designed to allow students to begin their intervention when they begin to fail, in this case, second grade.

Table 18

Intervention Students Who Nearly Met Both 1st (DRA 18) And 2nd (DRA 30) Grade End-of-Year Reading Benchmarks

DRA Level	RR		LLI		Both	
	%	*N*	%	*N*	%	*N*
DRA 14	13.5	33	10.8	26	13.5	18
DRA 16	11.5	28	14.5	35	12.0	16
DRA 24	22.8	23	17.9	14	10.3	4
DRA 28	17.8	18	12.8	10	20.5	8

Recommendations for School District Personnel

This research study confirmed the significant importance of a student's initial DRA level. Students who complete their kindergarten year with a strong literacy foundation are better prepared to learn how to read in first grade and carry that success through their second-grade year, regardless of the intervention in which they may or may not have participated. Family dynamics that often affect a child's school readiness include: the educational level of the mother; family's socio-economic status; mother's primary language; if the mother was married at the time of the child's birth; and if the child was raised in a single or dual parent household (Zill, Collins, West & Hausken, 1993, 1995).

As anticipated, a child's end-of-kindergarten reading level is the greatest predictor of that child's end-of-first-grade DRA level ($p = .000$). As educators we must continue to investigate the connection between a child's exposure to literacy in the preschool years and the child's kindergarten readiness. Due to the family dynamics that cause a child to come to school less prepared for school, it is recommended that school districts continue to invest in early literacy through an all day/every day four-year-old preschool program for the Schoolwide Title I and Title I schools. If that it not financially feasible, the school district's early childhood teaching and learning specialists should consider working with local child care centers to increase emergent literacy instruction in their four-year-old preschool programs (Girolametto, Weitzman, Lefebvre, & Greenberg, 2007). Through this program, students with a low socio-economic status will have an opportunity to learn their letters and numbers, write their first names, and practice the routines and expectations of a formal education before beginning kindergarten. The expectation will be that students will enter kindergarten ready to learn and to complete their kindergarten year with a reading level that is average amongst their peers.

Scaffolding reading instruction is a process that enables a novice reader to carry out a literacy task, solve a reading problem, or achieve a goal that is beyond their unassisted abilities (Graves et al, 2007). Reading Recovery is a first-grade only early literacy intervention for the most struggling of readers. Leveled Literacy Intervention is a kindergarten – 4^{th} grade intervention designed for tier 2 students but provides opportunities to effectively utilize the intervention with tier 3 students. It is recommended that districts review the effectiveness of their early literacy programs

and create mandatory scaffolding programs for students who participated in Reading Recovery and/or tier 3 Leveled Literacy Intervention.

Finally, as of fall 2014, many states have committed to providing all kindergarten students with all day, every day kindergarten (MN Department of Education, 2014). In 2010, one state set the following kindergarten reading standards:

> …with prompting and support the child should be able to ask and answer questions, retell key details of familiar stories, identify characters, setting and main events; ask and answer questions about unknown words in text; recognize common types of text; with prompting and support compare and contrast adventures and experiences in familiar stories; and actively engage in group reading activities with purpose and understanding" (MN Department of Education, Reading Benchmarks: Literature K-5, 2010, p. 14).

It is important for school districts to revise their early literacy curricula to address the changing needs and expectations of kindergarteners.

Literacy is the cornerstone of all learning. It is of the highest importance in all subject areas that a student is able to read and produce written material (Minnesota Department of Education, 2014). The final recommendation for a future investigation is for local districts to review their end-of-grade level DRA benchmarks in Grades K-3 to determine if they correlate with the necessary DRA levels needed to predict

students' third-grade Minnesota Comprehensive Assessment (MCA) proficiency. The Minnesota Department of Education (2014) states that reading well by third grade is an educational milestone. Curriculum, instruction, and assessment must be aligned with research-based practices to ensure that students are reaching this important third grade milestone.

Recommendations for Academics

The early literacy interventions—Reading Recovery and Leveled Literacy Intervention—are moving at-risk, non-special education students from tier 3 status towards grade level. A future study could analyze the exact components of the programs that are effective and what can be changed to make the overall programs more effective for the most at-risk first-grade readers. Additionally, what program changes can be enacted to produce greater longitudinal results for the struggling readers? A portion of this proposed future study will include collecting Reading Recovery data to determine the make-up of first and second round students. For those students who receive both Reading Recovery and Leveled Literacy Intervention during their first-grade year, what factors—such as reading readiness, slowly releasing the responsibility of instruction from the teacher to the student, student confidence—affect their end-of-year outcomes and vary based upon the order of intervention participation? Results should be compared to determine who achieved a spring DRA 18 score and what factors predicted the students' success.

Leveled Literacy Intervention is a K-4th grade intervention. A study comparing students who begin kindergarten with LLI supplemental reading

intervention and continue the intervention through fourth grade versus those who only have one or two years of LLI instruction will provide valuable insight into student achievement and intervention effectiveness. What are the differences in student make-up and student successes? What variables most accurately provide the greatest predictors of future success? What if the LLI groups were expanded from the ideal of three students to groups consisting of four-to-six students with similar literacy strengths and deficits? Would the results remain consistent and therefore allow the districts' financial resources to stretch further?

An important future study will follow-up on the long-term effects of Leveled Literacy Intervention. At the time of publication little research had been conducted on the program's short- and long-term effectiveness. LLI was introduced to the district under study in the spring of the previous year. If the study was replicated, now that the LLI teachers have become more familiar with the program, would student scores trend upwards or remain relatively the same? If the results trend upwards, at what point, if any, does the effectiveness of LLI reduce or eliminate the need for RR?

Concluding Comments

Reading Recovery is the "gold standard" by which many early literacy interventions are compared. However, the gold standard is costly, and districts may be looking to achieve similar literacy results for their struggling readers at a fraction of the costs associated with Reading Recovery. These costs include: Reading Recovery's one-on-one model vs. a small group model, extensive and on-going

teacher training, participation in the Reading Recovery Council of North America (RRCNA), and conference attendance at local and national Reading Recovery conferences.

Reeves (2007) shared, "The key to effective short-term wins is that the objectives are meaningful, attainable, and provide immediate feedback to reinforce effective practice and modify ineffective practice. Without short-term wins, the pain of change often overwhelms the anticipated long-term benefits" (p. 86). For districts that have already fully implemented Reading Recovery, it may be wiser to continue to capitalize on the passionate and educated teachers that RR inspires. The danger of eliminating a fully embedded program lies in the disillusionment of teachers and community members. New programs require a significant public relations campaign, teacher training, new materials, and the time associated with implementing the program to fidelity, and achieving results. Reading Recovery cites the extensive initial and continued teacher training as a key component of the program's success (RRCNA, 2014). Continuing Contact Reading Recovery teachers—those who are beyond their first year of teaching RR and includes all RR teachers in the study—are required to participate in a minimum of six professional learning sessions every year (ReadingRecovery.org, 2014). If a district has not yet implemented RR, is it possible to ignite similar passions and infuse the depth of literacy knowledge into teachers without adopting the limitations and expenses of Reading Recovery?

Reading Recovery and Leveled Literacy Intervention are early literacy interventions aimed at bringing struggling readers to grade level status through a 14-

20 week round of intense intervention. This study looked at the interventions as tier 3 programs focused on the most at-risk first-grade readers. Reading Recovery was found to be statistically significant in the area of text level growth ($p = .003$). Of the 244 first-grade students who participated in Reading Recovery, 47.1% met the end-of-first-grade DRA 18 benchmark and 57.4% of those students went on to also meet the end-of-second-grade DRA 30 benchmark. As a tier 3 intervention, Leveled Literacy Intervention was not found to be statistically significant in the areas of text level ($p = .607$). Of the 241 students who participated in Leveled Literacy Intervention, 35.5% met the end-of-first-grade DRA 18, and 62.8% of those students went on to also meet the end-of-second-grade DRA 30. Finally, for the combination of RR and LLI, this intervention was not found to be statistically significant in the area of text level growth ($p = .877$). Of the 133 students who participated in both interventions, 30% met the end-of-first-grade benchmark and 54% of those students went on to meet the end-of-second-grade benchmark, as well.

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